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MOTOR BOATING

609573



In This Issue
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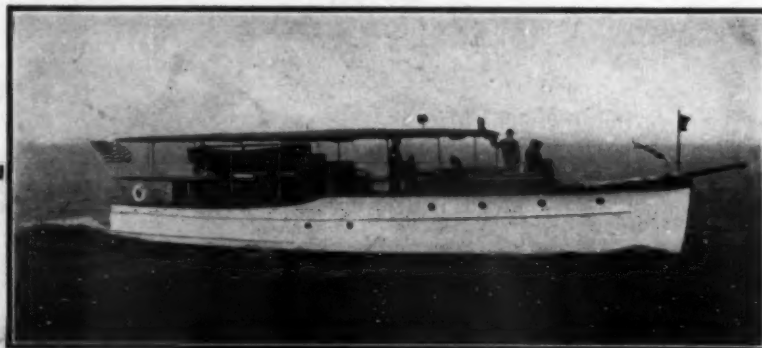
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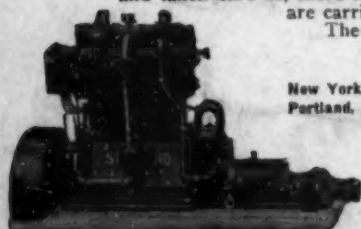
32 H.P. Standard
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Can the engineer be more infallible than Nature?
Can the machine be less a product of evolution than Life?
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stands forth to-day the product of practice in unequalled degree.

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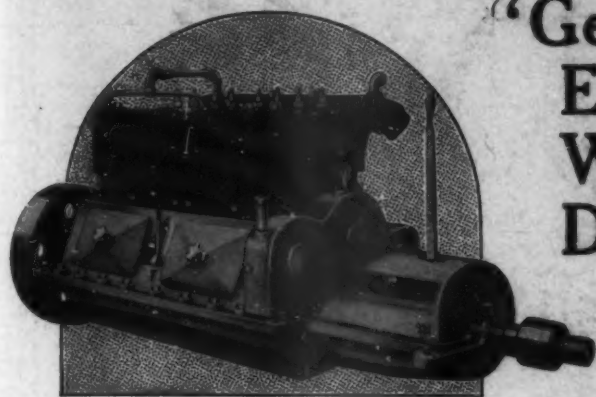
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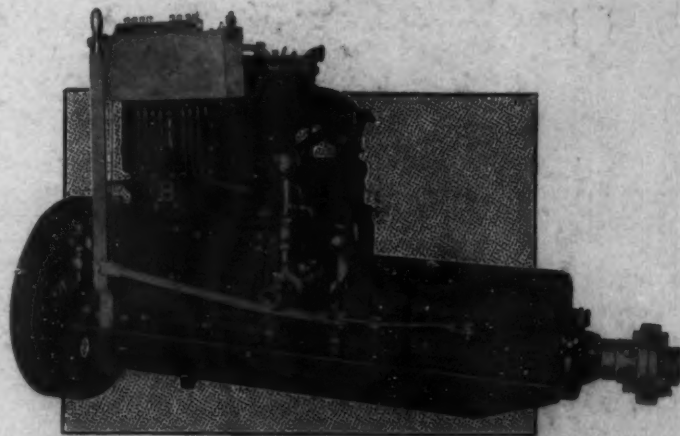
The excuse for most misfit engines lies in the fact that their manufacturer's line is limited. He makes but a few sizes of perhaps only one speed, and *he must sell what he has.*

On the other hand the Buffalo line is so large and so varied that we are able to study your particular case and prescribe an engine which will bring out the very best qualities of your boat.

That is just one more reason why Buffalo engines are so favorably known all over the world.

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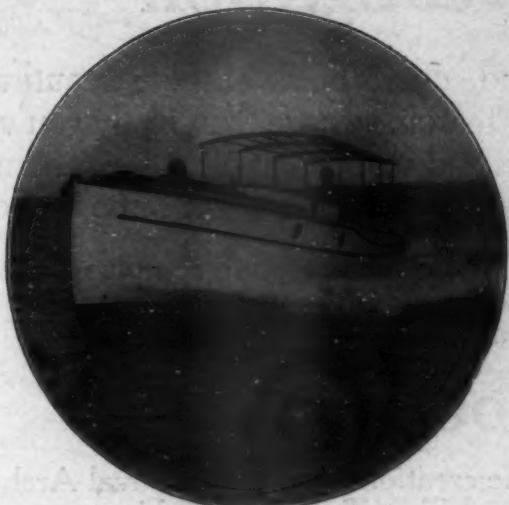


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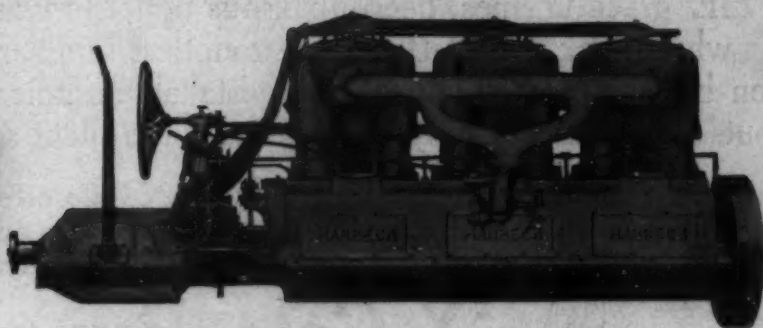
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Send for 1915 literature describing Hand's latest creations, particularly if you are interested in a new fast cruiser design.

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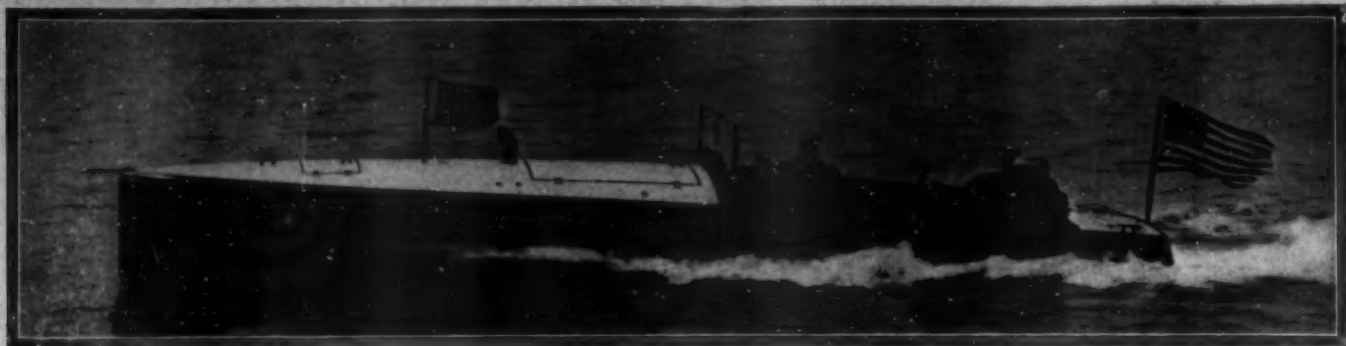
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X-CELO Runabout designs are our own and are the creation of our own Naval Architect: all are the result of most scientific tests in the Naval Test Tank at Washington. A practice undreamed of by the small builder.

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are only a few of the details of the Finest Motor Boat in the World!

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Milwaukee Yacht & Boat Company

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Milwaukee



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January, 1915

**MOTOR
BOATING**

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1916

THE NATIONAL MAGAZINE OF MOTOR BOATING

American submarine of the Holland type under way

The Terrible Underwater Motor Boat

The Diesel-Electric Craft Which Has Become the Most Dangerous Enemy of the Dreadnaught.
How the Marine Motor Has Been Utilized to Drive the World's Submarine Engines of Destruction

By L. B. Chapman.

THE last five or six years have witnessed a great advance in submarine design and construction. On account of the great secrecy in building this type of naval vessel, the public have been kept more or less in ignorance of its development and importance as a naval unit. The recent successful attacks of both the British and German submarines have suddenly brought the submarine before the public. A great many people who have been skeptical of this type of craft were more or less surprised at the success of these attacks, but those who are familiar with these boats were not in the least surprised, and look for even more daring achievements before the war is over.

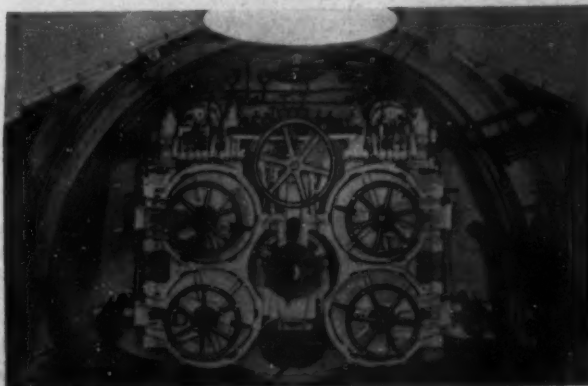
Perhaps one of the greatest factors making for the growth and recent rapid advance of the submarine has been the Diesel engine. The first submarines before the day of the internal combustion motor were propelled by steam engines. On submerging, the fires were drawn and the engines run on the steam stored in the boiler. This, of course, was unsatisfactory for a great many reasons. The weight and space occupied by the engines and boilers was large, and the radius when submerged was exceedingly short, depending upon the amount of steam that could be stored in the boiler. Moreover, if a steam pipe should burst while the craft was submerged it meant death to all the crew.

For this reason the submarine never became an important part of the navies until the introduction of the gasoline engine. This had been the means of propulsion up to about 1910 when the Diesel engine began to make its appearance in more or less perfected form. The gasoline

engine, although a great advance over the crude steam propulsion, had a great many drawbacks. First of all, the power of the engine was limited, it being impossible to build satisfactory engines in large powers. Consequently, the size of the submarine was limited by the size of the gasoline engine, and no large and powerful boats were built. Seal (now G-1) was the last of the gasoline engine submarines in the United States Navy. She has two 12-cylinder engines of 600 h.p. each, but has never been free from engine troubles. Besides the limit in size of the gasoline engine, gasoline was an exceedingly dangerous fuel to carry in naval vessels, and the fact that it is very volatile often lead to poisonous fumes and, in some cases, to explosions. This was very bad in the submerged condition when the hatches were all battened down and the men confined in a limited space. It is obvious that anything, such as gasoline, tending to contaminate the air supply when submerged, would be discarded at the first opportunity.

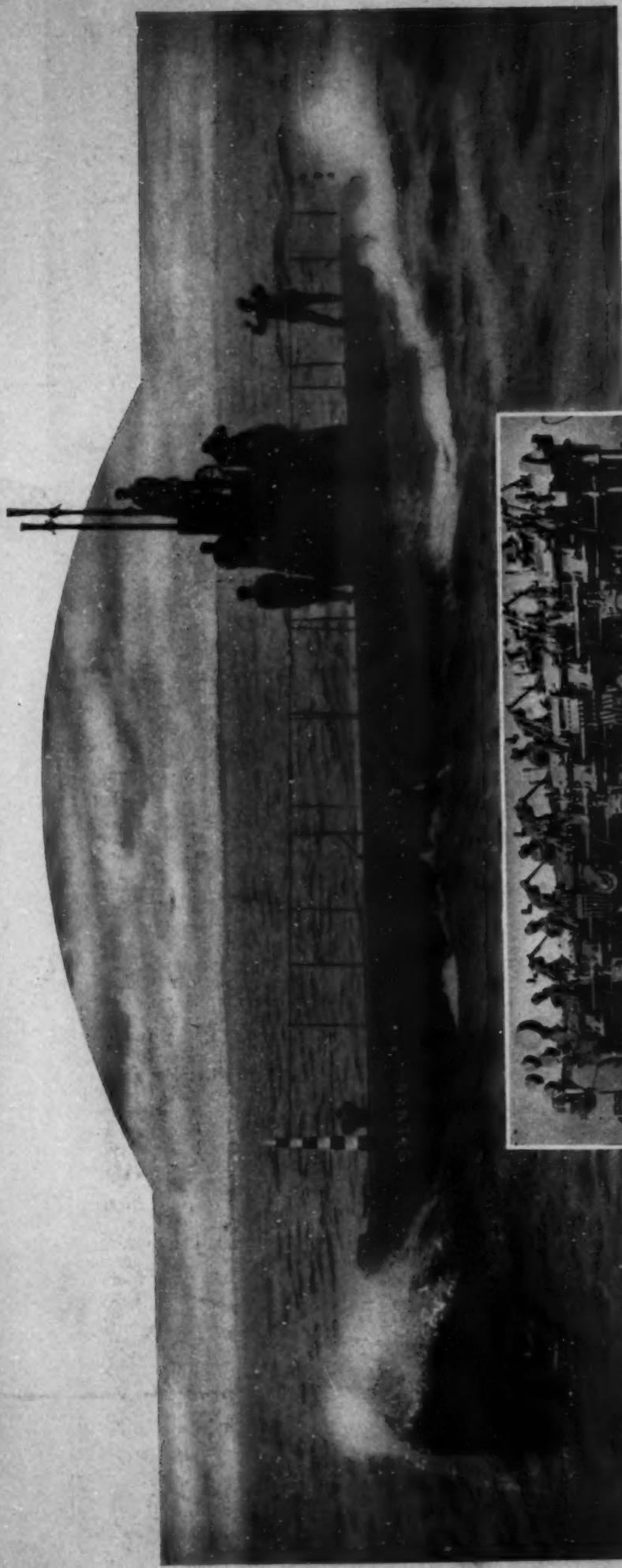
As most of the readers of this magazine know, the Diesel engine can be built in fairly large units, up to 1,200 h.p. and even larger, and uses crude petroleum for fuel, which is not only cheaper than gasoline, but gives off no dangerous or poisonous fumes. Besides these two important qualifications, the Diesel engine is easily started and reversed. The first boats to be equipped with Diesel engines in the United States Navy were E-1 and E-2, which went into commission in 1912. These engines were of English make and, being the first Diesel engines in the navy, have given considerable trouble, as might be expected.

The latest submarines in



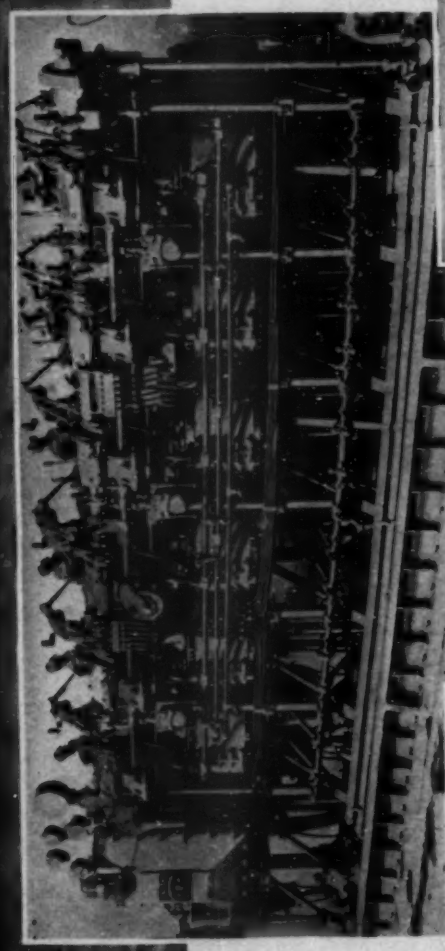
Holland type, looking forward, showing four torpedo tubes and torpedo firing mechanism.

Except for the flag, this is the way the submarine appears to the battleship just before she is attacked—if she sights her at all.



Salmon, an American submarine at a 12-knot speed. the navy are the K class, of which there are eight, all equipped with two 450 h.p. Nilsco engines, built by the New London Ship and Engine Company. These engines are the Nuremberg design, and are built in this country under German patents. This make of engine has been one of the most successful of the Diesel engines, and has been used in submarines of the Russian,

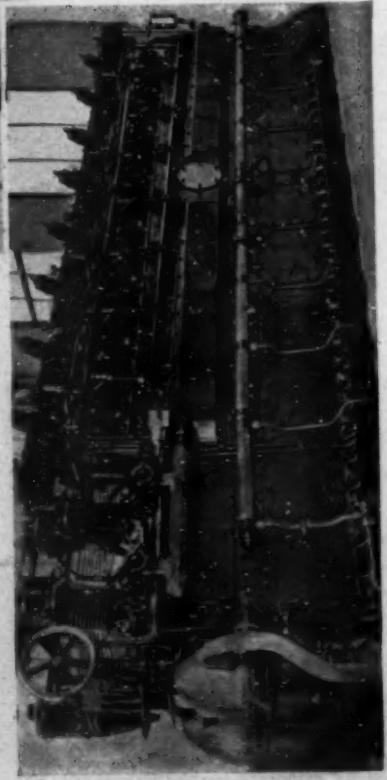
on the surface and, incidentally, forming a deck for use in surface condition. The tendency in submarines to-day is for a high surface speed and a comparatively low submerged speed. This is causing a more ship-shaped form of hull in the latest boats, as it is impossible to attain high speed with the spindle form of hull. The new M class of the United States Navy is of this type.



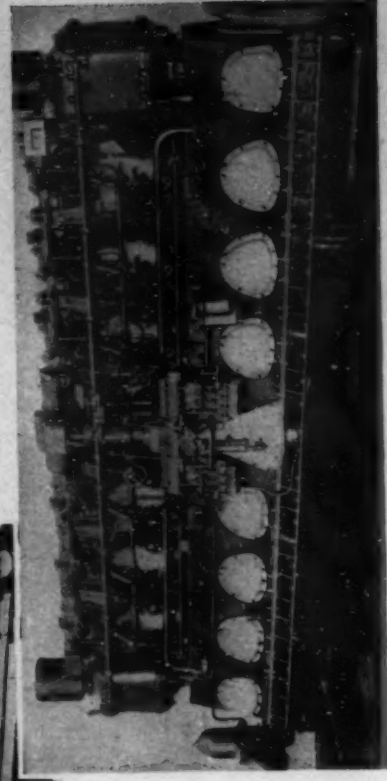
Nobel motor used in Russian submarines.

Italian type and has been very successful abroad, but, due to the new conditions and the use of American equipment, the United States boat did not come up to expectations. Germany and France have developed their own types, and except for the main facts little is known of these boats. The essentials in all the types are alike, however, and the description that follows will apply equally to them all.

The real purpose of the submarine is to deliver a torpedo attack



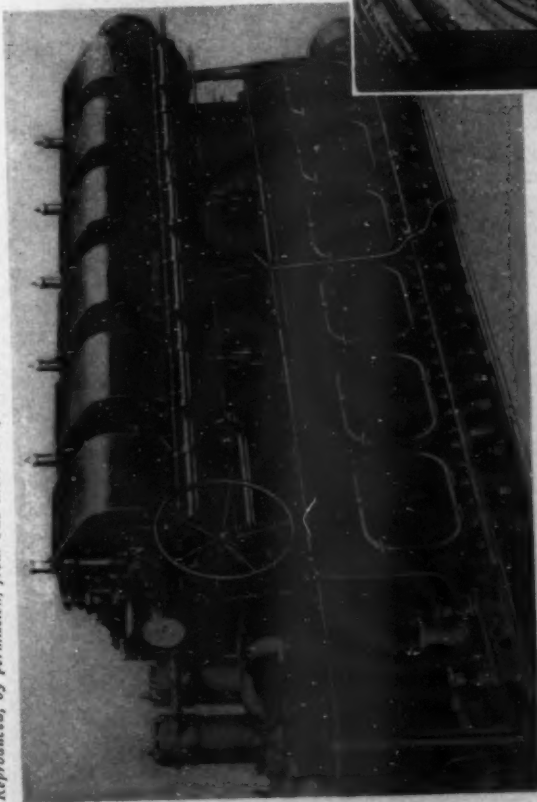
Nuremberg motor employed by the Germans in some of their successful submarines.



Krupp motor in German and Russian submarines. Motor photographs reproduced, by permission, from *The Motor Ship and Motor Boat* (England).

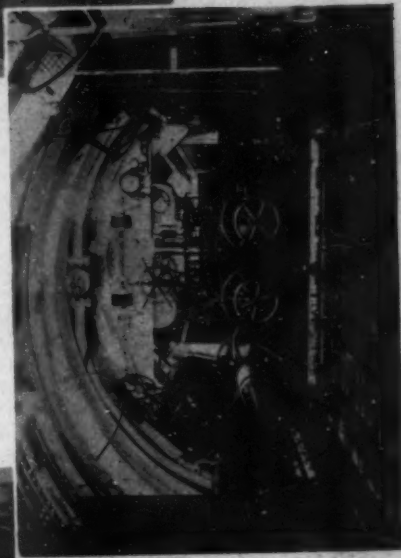
Nuremberg motor employed by the Germans in some of their successful submarines.

Reproduced, by permission, from The Motor Ship and Motor Boat (England).



The real purpose of the submarine is to deliver a torpedo attack

against the enemy, and for this reason it is the most important point to be kept in mind. Most of the submarines are of spindle form and are circular in section. This form of hull is the easiest to drive under water, but is difficult to drive on the surface, and sets up bad wave disturbances. For this reason a superstructure is built on top of the spindle, as is clearly seen from the illustrations, thus giving a better form

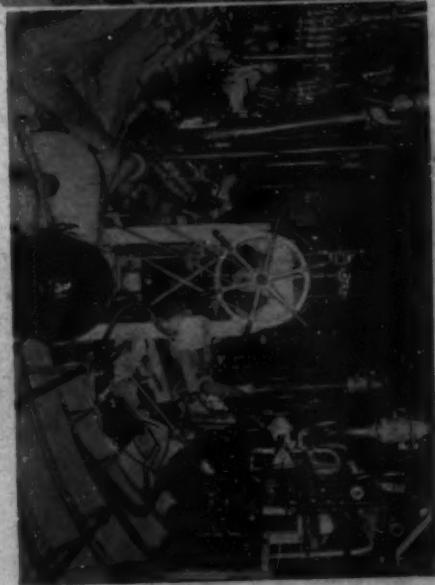


American submarine, looking forward, showing torpedo and batteries. (Battery top removed.)

Augsburg motor in German and French submarines.

German, Dutch, Danish and Austrian navies. Before taking up the engine in detail let us turn to the submarine and get some idea of its equipment and methods of operation.

There are a number of types of submarines in the navies of the world. In our navy we have the Holland type, built by the Electric Boat Company, the Lake and the Laurenti types. The first named includes most of the submarines in the navy and nearly one-half of the world's submarines as well. The English submarines are of this type as are nearly all those of Russia, Holland, Japan and Austria. The Lake type, while comprising many excellent features, has so far not been very successful in the United States Navy. The Laurenti boat built for our navy was pretty much of a failure. This is an



Central control compartment showing steering gear, diving controls and levers for flooding tanks.



Aft, looking forward in an American submarine, showing electric motors and engines.



Depth gauge, diving rudder control wheel and clinometer in one of our latest type submarines.

Krupp motor in German and Russian submarines.

Motor photographs reproduced, by permission, from The Motor Ship and Motor Boat (England).

Reproduced, by permission, from The Motor Ship and Motor Boat (England).



Sulzer type of motor used in some American and Japanese submarines.

The submarine is divided into watertight compartments, the same as other ships are, each compartment being separated from the adjoining one by a strong watertight bulkhead. Most of them are built so that they are capable of submerging to a depth of 200 feet. The pressure at this depth is nearly 100 lbs. to the square inch and calls for a strong and well-designed hull. The spindle form of the Holland boats lends itself to this requirement better than any other. The latest United States submarines of the K class are approximately 153 feet long, 16 feet in diameter and have a submerged displacement of 480 tons. They have twin screws, being driven by two 450 h.p. Diesels running at 450 r.p.m., which gives a speed of close to 14 knots on the

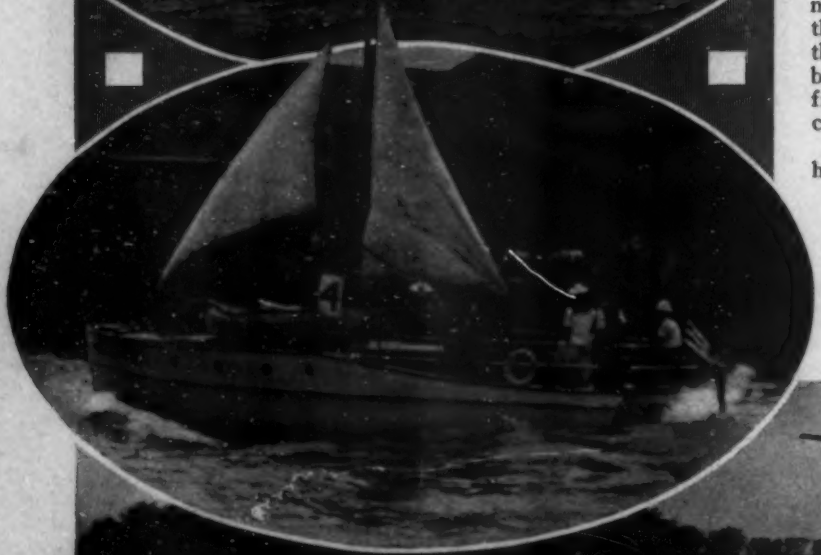
(Continued on page 47.)

Auxiliary Sails



The regular fore and aft sail used without a main boom and two small head sails.

**The Use and Application of Small Canvas
The Lug Rig, Leg of Mutton, Gaff-Headed,**



FEW motor boatmen realize what an important feature auxiliary sails can be made to assume on the average cruiser of to-day. All of us have, for a long time, been impressed by the importance which the gasoline motor plays as auxiliary to the strictly sailing craft, both pleasure and commercial, but as yet very few motor craft are fitted with sails as the auxiliary. Not that the modern gasoline motor is at all unreliable or that there is danger that some part of the power plant will go bad when least expected and leave us stranded many miles from home, for that is only of secondary importance when considering the value of sails.

Of necessity, most of the modern motor cruisers are high sided, more or less shoal draft affairs, which naturally roll around more or less in a seaway, especially in the trough when the wind happens to be abeam. Not dangerously to be sure, but just a trifle uncomfortable, perhaps. A small sail in this case will help a whole lot; in fact, much more than one would expect.

The steadying effect is remarkable, even though the area of the sail is comparatively small. An



One of the handiest and best sails is the jib which can be readily hoisted on the fore-stay.

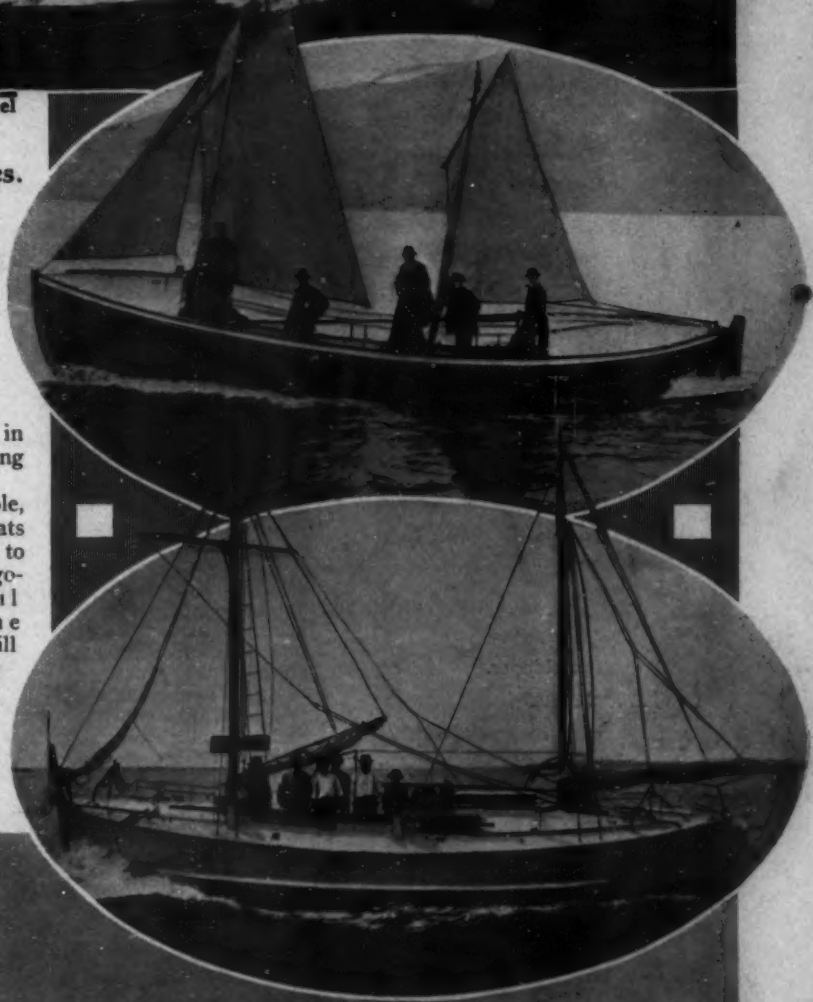
for Motor Boats

The leg o'mutton sail boomed out, and small jib on Eronel II, the Halifax racer.

for Auxiliary Driving or Emergency Purposes.
Fore and Aft, Jibs and Fore-Sails.

example of this is often noticed on the sea-going tow-boats and barges, which in themselves are of heavy and clumsy design, and on which one would least expect a small sail to be of service. Yet very often these types of boats use a sail or sails which, in themselves, appear very insignificant, but are of a very decided help in steadying the boat and preventing her from rolling excessively.

The driving power of a small sail is also remarkable, especially with boats of a small draft, as most motor boats usually are. Of course, the wind must be favorable to get the most out of sails from this source, as going to the windward is not a very successful operation with most cruisers. But with the wind abaft the beam, the gasoline line bill will be greatly reduced, and the speed of the boat increased very appreciably by having a small amount of canvas spread. Some of the cruisers which have successfully used sails are illustrated on these two pages.



The use of the modified lug-rig on Kathemma, one of the Bermuda racers.



Balanced railroad bridge at Bourne near the southern end of the canal.

A Short But Exciting Cruise Made in the Late An Illustration of the Sea-Going Qualities

By George



The skipper.

A FROST-NIPPING CRUISE was that last November of the life boat cruiser S. O. S. from Boston to West Mystic, Conn. The boat traversed the Cape Cod canal because time was at a premium. Incidentally,

some very interesting photographs of the waterway were secured by G. S. Roche, captain of the little craft, showing how business is conducted in the short cut between Cape Cod Bay and Buzzard's Bay.

The start was from City Point, November 9th, with ice in the tender and the famous rendezvous deserted except for the few yachts that are not protected by insurance that stipulates they shall be in winter quarters when the bleak winds sweep the summer's cruising grounds. S. O. S. had had her insurance extended so there would be no come-back should anything happen like a parted mooring pennant or damage by ice.

After breaking up the ice that clung to the tender bottom the boat was hauled on deck and lashed. The wireless masts were taken down and lashed, one on either side of the cockpit. These masts served as life rails, as shall be seen later. From the mooring off the Boston yacht club station, S. O. S. was run to the public landing at Summer Street, and, at 10:45 A. M., after filling fuel tanks from a hulk off the Fish Pier, stood down har-

bor, passing Boston light at 1 P. M.

A raw wind, such as one might expect in bleak December, was piping off the land, but the atmosphere was clear, as usually is the case with northwesterners at that season. A course was laid for Minot's light, about nine miles out in the bay, having it abeam at 2 o'clock. A heavy swell was coming from the northeast, reminder of a storm, and the northwester was piling a new sea on top of that. The cross sea soon assumed annoying proportions farther out in the bay. From Minot's the wireless pole at Brank rock was sighted. Passing Scituate Harbor at 2:35 o'clock, the wireless station was abeam at 3:40. Forty minutes later rounded the Gurnet and headed up Plymouth harbor. The spar buoys seemed out of position, and it



Toll - collecting boat coming alongside at Sandwich.



Wireless masts lashed alongside as life rails and method of steering the cruiser from the after part of the cockpit.

Through the Cape Cod Canal

Highway bridge at Bourne. Note remarkably clean wake left by boat.

Fall in Which Very Heavy Weather was Encountered. of the Properly Designed Small Motor Cruiser.

Story Hudson

was 5:30 when the boat found anchorage in a fathom of water at the steamboat wharf.

It was very cold and blowing hard. Fast at the wharf was the motor fishing vessel Gyda, whose crew said it was too rough for them to cross the bay to Provincetown. That night S. O. S. got hung up on the edge of a dredged spot and was kedged off. The boat remained at Plymouth next day, leaving for the canal Wednesday, at 8:30 o'clock, weather cloudy and calm.

At 9 o'clock passed the Gurnet, wind beginning to freshen from south, starting a small chop. The boat frightened many flocks of ducks and geese—evidently good gunning in that locality. Made the breakwater at the Cape Cod Canal at 11:30, weather beginning to look better. Having

cooked a

square meal and shifted clothes, prepared to go through. The collector was on hand for his toll almost as soon as S. O. S. got within canal limits. The toll for the 36-foot S. O. S. was \$12, Traffic being the vehicle that brought W. L. Garring, the uniformed official, alongside. Other boats used by the canal company are Manomet, a glass cabin craft, and Sea Level, an open boat.

The run through the canal was made at slow speed to enable the camera to record progress. For the greater part the waterway is uninteresting, the banks being brown with sand, filling material and rip-rap that serves to keep the tides from eroding the banks. Uplands, pitch pines and pastures predominate with farms scattered here and there. The Kieth car works, a busy community, served admirably by the canal, thrives near the northerly entrance, and it seemed like home amid such activity. The wind grew colder and ear muffs would have been welcomed by S. O. S.'s crew. Instead, oilskins and sou'westers were donned, and Captain Roche and his crew crouched to keep warm.

Evidently the canal

people wanted to be prompt with S. O. S., for there was no waiting. The tide was running so swiftly that care had to be exercised in approaching obstructions. Posts supporting electric lights showed the velocity of the current, these poles being set in cement to lessen possibility of their carrying away.

That night S. O. S. anchored at Onset and found the once famous resort of Spiritualists practically deserted. This anchorage is landlocked, and approached by several narrow channels, the principal one from direction of Wing's Neck, where the dredged channel to the canal ends. In the summer time Onset is a merry place with its band concerts, yacht races and trolley cars. This night, however, there was nothing stirring to entice yachtsmen.

Early Thursday the boat got under way, passing Bird Island light at 9:15. S. O. S. hauled up for New Bedford to purchase supplies. Anchored off the New Bedford Yacht Club at 4 o'clock, and all hands enjoyed a hearty meal, the first since morning.

Friday, the 13th, proved full of incident for the cruisers, though indications did not look at all out of ordinary when the boat was headed into Buzzard's Bay at 8 o'clock. By the time S. O. S. had rounded the Dumpling, however, she jumped into the wickedest chop ever experienced by those aboard. She was held on a course that made the going hard,

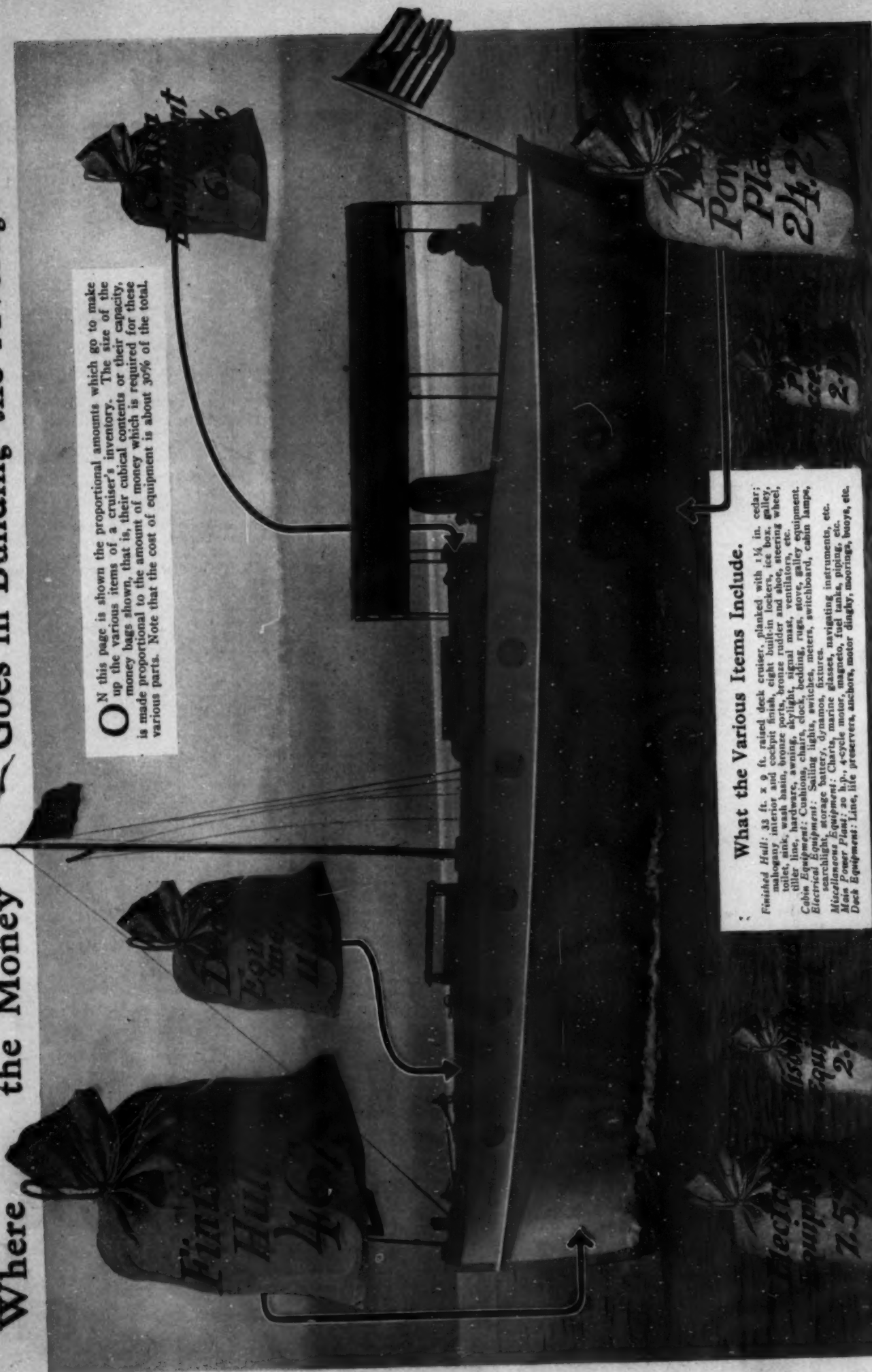
(Continued on page 56)

Breakwater at
Sandwich
end of
canal.

Passing over the check for twelve dollars and receiving the clearance papers.

Where the Money Goes in Building the Average Cruiser.

ON this page is shown the proportional amounts which go to make up the various items of a cruiser's inventory. The size of the money bags shown, that is, their cubical contents or their capacity, is made proportional to the amount of money which is required for these various parts. Note that the cost of equipment is about 30% of the total.



What the Various Items Include.

Finished Hull: 33 ft. x 9 ft. raised deck cruiser, planted with 1 1/4 in. cedar; mahogany interior and cockpit finish, eight built-in lockers, ice box, galley, toilet, sink, wash basin, bronze ports, bronze bulkhead, steering wheel, tiller line, hardware, awning, skylight, mast, ventilators, etc.

Cabin Equipment: Cushions, chairs, bedding, rugs, stove, galley equipment.

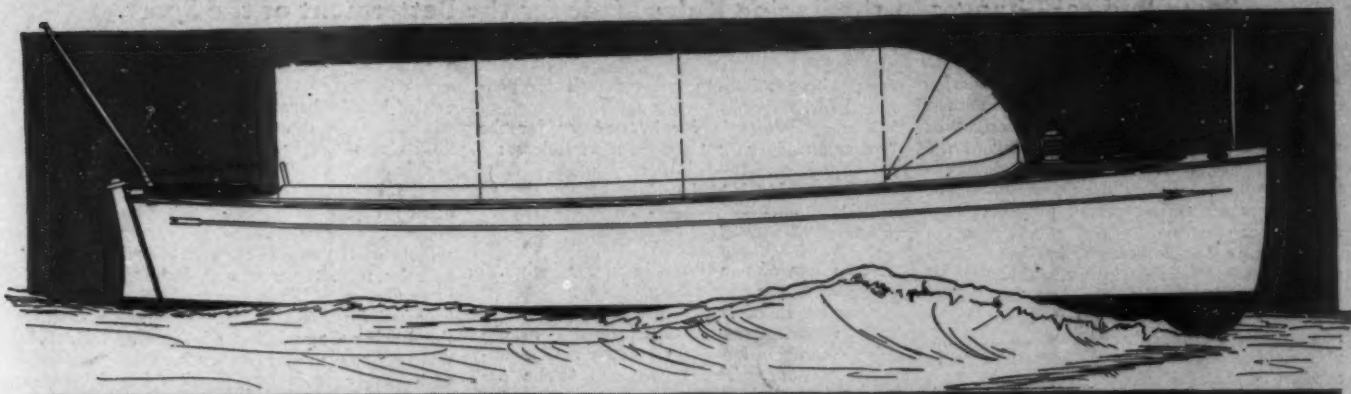
Electrical Equipment: Batteries, lights, switches, meters, switchboard, cabin lamps, searchlight, etc.

Miscellaneous Equipment: Charts, marine glasses, navigating instruments, etc.

Motor Plant: 20 h.p. 4-cycle motor, magneto, fuel tanks, piping, etc.

Deck Equipment: Line, life preservers, anchors, motor dinghy, moorings, buoys, etc.

Possibilities of the Small Boat.



**Making Available and Practical Many of the Accommodations Usually Found in a Cruiser.
How the Man Who Prefers a Small Open Boat Can Get the Most Out of It.**

By Herbert Ernest Hancock.

THE man "who wants but little here below" in the motor boat line, generally tries to get as much as he can out of "the little." It was with this desire in mind that the writer turned over his ideas to Whittelsey & Whittelsey, the designers, who produced the plans illustrated here.

The result shows itself in a boat twenty-two feet, six inches over all, with an extreme beam of five feet, six inches, and shallow draft. This boat, incredible as it may seem, sleeps four persons comfortably, contains an icebox, toilet and supply facilities equal to those provided by a small cabin cruiser. In comparison to the cruiser, however, this small open boat, with its specially designed hoods, provides perfect shelter for its occupants, and wonderful ventilation, the lack of which has always been the bane of the small cruiser owner. In addition, it calls for light ground tackle and an easily handled engine. These two items always appeal to the man of small muscle, whose boat-living soul shrinks at thought of handling anything heavier than a thirty-pound anchor.

But, above all, this boat has been thought out along lines of extreme seaworthiness and comfort, both lacking in the average small boat except among the high-priced little fellows. The writer's bargain with the designers was to the effect that he would provide the ideas for comfort inside if they would guarantee dryness. In consequence, the designers have turned out plans for a boat that they claim will withstand "any weather Long Island Sound can produce."

Before going into detail, the matter of price should be spoken of. Building this boat complete in every essential detail, including cushions, hoods, anchors, ropes, etc., and a power plant consisting of a seven horsepower, two-cylinder jump-spark Stanley engine with Detroit clutch, will cost you half what they ask for a cruiser of equal accommodations. That is, if the contract is to be given to a regular builder. This gives you a boat of plain finish, and low detail expense, but substantial and

lasting. If you can afford to dabble in fancy woods, high-priced plumbing and power plants, you can run its cost up to a much larger figure.

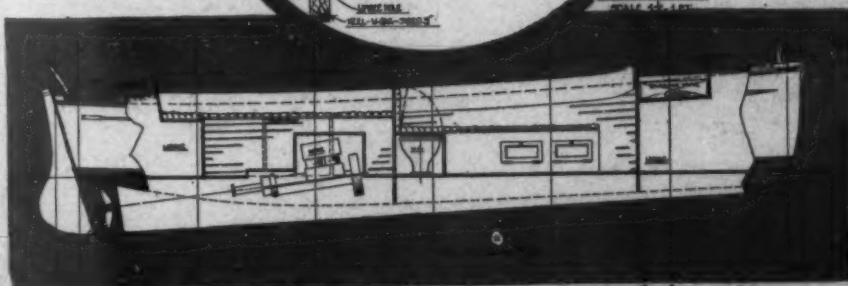
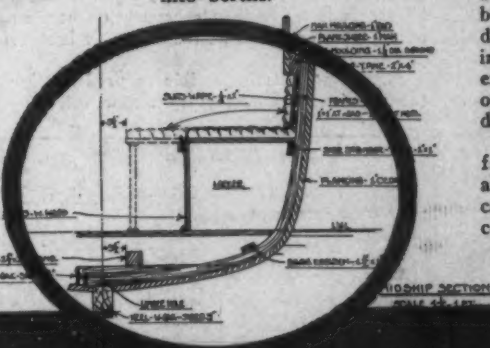
But one does not have to buy a new boat to take advantage of the suggestions for comfort contained here. A remodeling of the ordinary stock open boat will prove a delightful occupation in fitting-out time and make it more than ever a thing of joy.

The hull itself is designed along easy lines with extreme forward flare designed in such manner that even in the heaviest seas the water must be thrown away from the sides. If the plans are properly carried out this boat will not "spank" in rough water, but descend with easy entrance, another point insisted upon by the writer whose years of experience in small boats that "spank" often reminded him forcibly of childhood days in the woodshed with father.

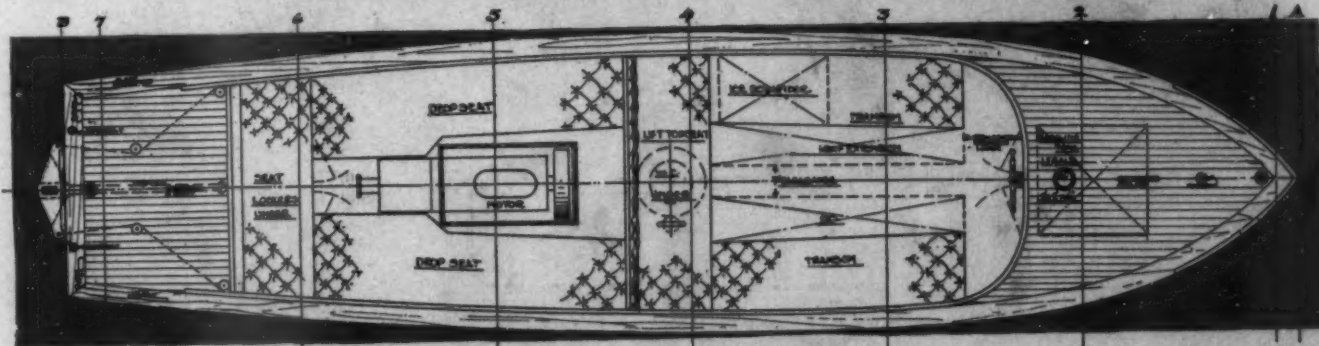
The side planking is of one inch cedar, frames of white oak, flooring, sheathing and deck planking of pine. The boat also calls for longitudinal stringers, a mahogany coaming, and amidship bulkhead. These woods, with their dimensions, are a matter of choice with the owner.

In the interior arrangement, however, the writer planned this design virtually fore and aft from amidships. Forward of the amidship bulkhead is a cross seat 27 inches broad. This is lockered and has a small pump closet centrally located. Built in forward of this cross seat are two lockered

Detail of method used to convert side seats into berths.



Sectional profile, showing location of motor, storage lockers, etc.



Arrangement plan of Mr. Hancock's 22½' x 5½' open boat.

A10 Knot 45 Footer

PEGGY, designed and built by A. Apel, of the Ventnor Boat Works, Atlantic City, N. J., is a comfortable and seaworthy cruiser, rating 58.5, which has made 10.25 knots in a sanctioned race, and is capable of a speed four statute miles greater than this figure. She is divided below with toilet-

room following the chain locker, saloon next aft, and engine-room, pantry and crew's quarters following. Her speed is derived from a 4-cylinder, 50 h.p. Mercury engine, fed by two Jasco tanks. Peggy, which made a good racing record last summer, is owned by Commodore Samuel W. Whan, of Philadelphia.

Looking forward

in Peggy's cabin.

Photographs by F. J. ...
The interior is paneled and finished in white enamel with the exception of the engine-room, which is left in natural oak. In the top picture, observe the long scuppers and the gunwales, extending 10 inches or more above the main aft-deck.

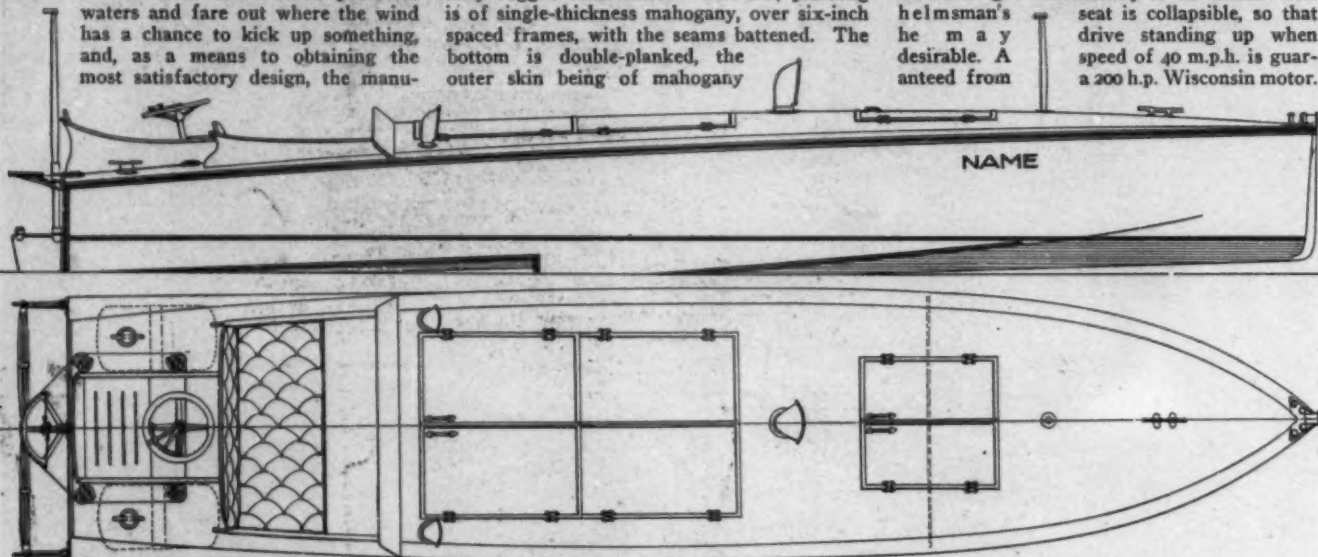
A Rough Weather Hydroplane.

A 26-Ft. Hull Designed After Numerous Tests with Small Models at the Government Testing Basin. Having a Bottom Double-Planked with Mahogany and Cedar and Hull of Rugged Build.

THE accompanying designs show a 26-foot hydroplane with a beam of 5 feet 8 inches, recently built for Carl G. Fisher, of Indianapolis, by the Milwaukee Yacht and Boat Company, of Milwaukee, Wis. In addition to a speed of 40 m.p.h., Mr. Fisher wanted a craft that could leave protected waters and fare out where the wind has a chance to kick up something, and, as a means to obtaining the most satisfactory design, the manu-

facturers made use of the government's testing basin at Washington, and there tested out several models. When a satisfactory model was fashioned—one that would not jump at extremely high speeds—the keel of the 26-footer was laid down and the hull built up of particularly rugged construction. The side planking is of single-thickness mahogany, over six-inch spaced frames, with the seams battened. The bottom is double-planked, the outer skin being of mahogany

and the inner of cedar, the whole being securely fastened by copper rivets. Two watertight bulkheads isolate the engine-room and divide the hull into three compartments. There are passenger accommodations for three, and the helmsman sits in the stern, with all controls arranged conveniently to his hands. The helmsman's seat is collapsible, so that he may drive standing up when speed of 40 m.p.h. is guaranteed from a 200 h.p. Wisconsin motor.



A 26-foot hydroplane with a guaranteed speed of 40 miles, which has been built for Carl G. Fisher.

A Motor Boat with Legs.

Having an Ingeniously-Contrived Device for Prying Jo-Lo Off Bottom with the Least Trouble. Other Noteworthy Electrical Features, Including Electric Capstan, Motor Tender Hoist, Etc.

ONE of six cruisers to leave the yards of the Matthews Boat Company, of Port Clinton, Ohio, last fall, was the 55 by 12-foot Jo-Lo, owned by J. A. Williams, president of the K-W Ignition Company, of Cleveland, Ohio. This boat, which was intended for Florida service and is now in southern waters, is of the tunnel-stern type, which has been worked out successfully in several of this concern's recent cruisers, and the general construction is of the usual Matthews type—heavily built. The interior layout of this cruiser is such that the boat is not cut up into small compartments. Each room is made comfortable and of ample size, with good headroom, light and ventilation.

The motor installed is a 32 h.p. Standard, fed from gasoline tanks at the forward end, having a combined capacity of 440 gallons, or sufficient to give the boat a cruising radius of 1,500 miles. All motor controls are brought alongside the wheel for one-man operation.

Perhaps the outstanding feature of this craft is the completeness of the electrical equipment. A 32-volt electric plant is installed, and in connection with this is an electric bilge and fire pump, and an air pumping set. Then there is a hoisting rig for lifting the motor tender on board. The rig will handle any weight up to 1,700 pounds, and the tender, which, in this case, weighs 400 pounds, is lifted to its chocks on the after house in three or four minutes. Thus, one of the most disagreeable manual jobs on a small boat is done away with. To carry further the idea of letting the current do the work, an electric capstan, not shown in the accompany photograph, was especially built for Jo-Lo by the Matthews company for hoisting the anchor aboard. In this capstan the motor and transmission are entirely enclosed, no moving parts being outside the shell. All controls are placed on the capstan. Used in conjunction with the short bowsprit, from which the anchor is hung, it

is an easy matter to up-anchor and shift from one fishing place to another.

The most startling innovation in electrical equipment on Jo-Lo, however, is a device of Mr. Williams' own design which is intended to simplify the business of backing off when the boat runs aground. This outfit, in which the owner takes considerable pride and calls "a pair of grasshopper legs," consists merely of two levers attached to the sides of the boat, near the waterline amidship, and operated by an electric windlass. In the photograph will be seen a slight projection near the waterline, which is the starboard grasshopper leg socket. When the boat goes aground—and going aground in Florida waters is no evidence of poor seamanship—it is not necessary to send a man forward with a boom and another astern in the dinghy with a kedge, as the levers are simply fitted in place, the electric windlass speeded up, and the hull quickly and easily pried off backwards into deep water.



Jo-Lo is a 55-foot tunnel-stern cruiser owned by J. A. Williams, of Cleveland, O., and cruising at the present time in Southern waters. Interest in this craft centers in her exceptionally complete electrical equipment and the means of getting her off shoals.

Walrus, a Fast Motor Ferry.



WALRUS, owned by George Bullock, of New York, is a fast motor ferry built last summer by the New York Yacht, Launch and Engine Company, of Morris Heights, N. Y., after the plans and under the supervision of Cox & Stevens, of New York City. The dimensions of this boat are: Length over all, 40 feet; beam, 9 feet 6 inches, and draft, 3 feet 3 inches. The owner has a country place on Center Island, Oyster Bay, and the ferry is used for carrying not only himself and his guests to the mainland, but also for transporting tradespeople, servants attached to the house, and baggage. The trip is quite an exposed one, and for that reason an able vessel was essential.

In order that the owner and his guests may be completely separated from what may be

Photographs by M. Rosenfeld.



tion. From this cockpit on the forward side access is had to the owner's cabin, which is 9 feet in length, and is arranged with a sofa on either side, each of which may be made up into a berth. The compartment also contains a bureau, toilet, locker and folding wash basin. The cabin has full headroom under the beams.

Directly aft of the cockpit is a small shelter house for the owner's service, having transom on each side, a dresser with place for stowage of dishes, and an icebox. Aft of this house, and communicating with it by a companionway, is the after or baggage cockpit, which has room for the stowage of a number of appliances or stores, and has a tarpaulin to protect it from the weather.

When not in use as a ferry launch, this boat makes an excellent cruiser for a small party, and, having a good speed and weatherly qualities, it certainly combines many desirable features.

The form of hull adopted by the designers is one having good freeboard and a lively sheer, straight stem, flaring sections forward, and a broad transom aft, so as to secure the greatest possible amount of room in the vessel, and, at the same time, insure a model that would drive easily and be a good seaboard.

The construction is of the best throughout, the keel, deadwood and frames and other heavy members being of oak, planking of yellow pine, deck of white pine, coamings and exterior of house of mahogany. All fastenings are of copper composition and all deck fittings are of polished brass.

The 30-h. p. 20th Century motor is placed beneath the cockpit floor.



Interior of the service compartment aft.

termed the working part of the boat, the ferry was arranged with a large cockpit amidship, a baggage space and shelter for tradespeople at the after end, and a cabin forward for the owner and his guests.

The motive power consists of a 20th Century, 4-cylinder, 30 h.p. engine which gives a speed of better than 12 m.p.h., this engine being located practically amidships and underneath the main cockpit floor, being directly operated by levers and by spark and throttle controls attached to the bulkhead at the after end of the forward cabin, the steering-wheel being also located at this place. The cockpit is 10 feet in length, and has a large, comfortable sofa extending across its after end, there being room for a number of wicker chairs in addi-



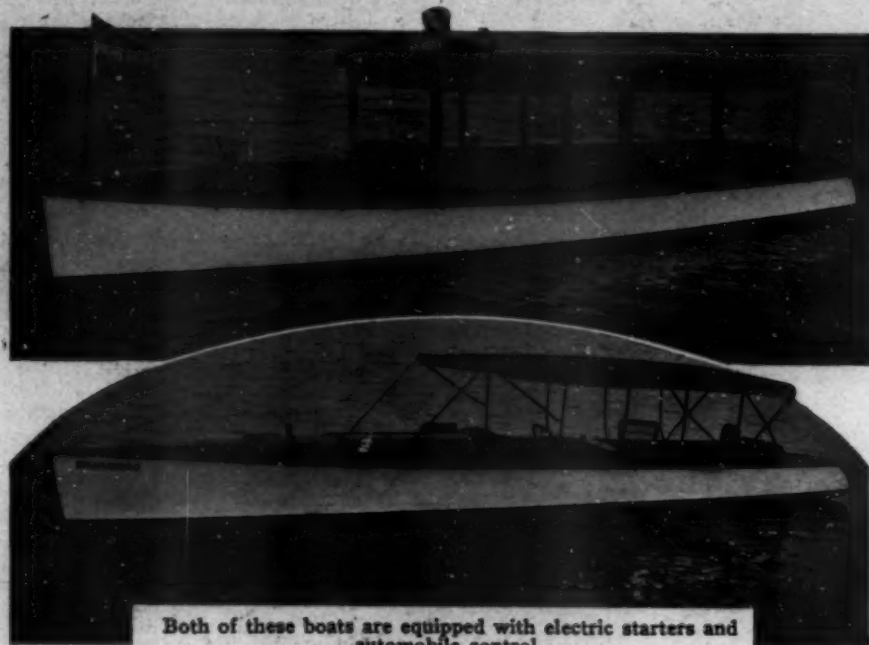
The owner's cabin is fitted with sofas and bureau, and in the after end with toilet and wash basin.

Two Interesting Runabouts.

One of Them Being a Family Craft with Standing Top and Exceptional Deck Chair Capacity. The Other, a Narrow-Beam Boat with Sharp Bow and Clean, Speedy Lines.

THE two photographs on this page illustrate recent boats put out by the Everett Hunter Boat Company, of McHenry, Ill.,

manufacturers of many types of hull, which are carried in stock for immediate delivery. The upper picture shows a 30-ft. family runabout having a beam of 6 feet. This craft, which has a standing top with curtains to render the cockpit stormproof, has a large seating capacity in the fixed transoms and wicker chairs. The helmsman drives from the starboard side of the boat, and as the 6-cylinder Rutenber motor, with which the boat is equipped, is fitted with an electric starter, control of the boat is an easy matter. The motor is set forward under the deck, and is accessible through hinged hatches. An electric searchlight, controlled from the cockpit, surmounts the standing top, and the electric running lights are also placed in this commanding position.



Both of these boats are equipped with electric starters and automobile control.

Wanamingo, portrayed in the lower picture, is a semi-speed runabout with good carrying accommodations, having a length of 30 feet

and a beam of 4 feet 9 inches. This boat is fitted with a 20 h.p., 4-cylinder Loew-Victor motor with electric starter. The cockpit arrangement allows a full-width, cushion-covered transom directly aft of the steering wheel, which, in this case, is placed on the port side, and a transom aft, with space between for deck chairs. The motor installation is under the forward deck where it is easily accessible, although the electric starter permits of starting and operating entirely from the wheelman's seat. This runabout, which is fitted with a serviceable automobile top, has a sharp bow and clean, speedy lines.

Some recent stock models put out by this concern include a 44-foot enclosed cabin river cruiser, which draws little water, and is thus particularly adapted to inland cruising, while the large carrying capacity fits it for taking out picnic parties. Another one of their interesting

craft is an 18-foot, 6-inch runabout with a beam of 5 feet, which is suitable for any small motor of the 2-cycle type.

A Fast 35-Foot Cruiser.

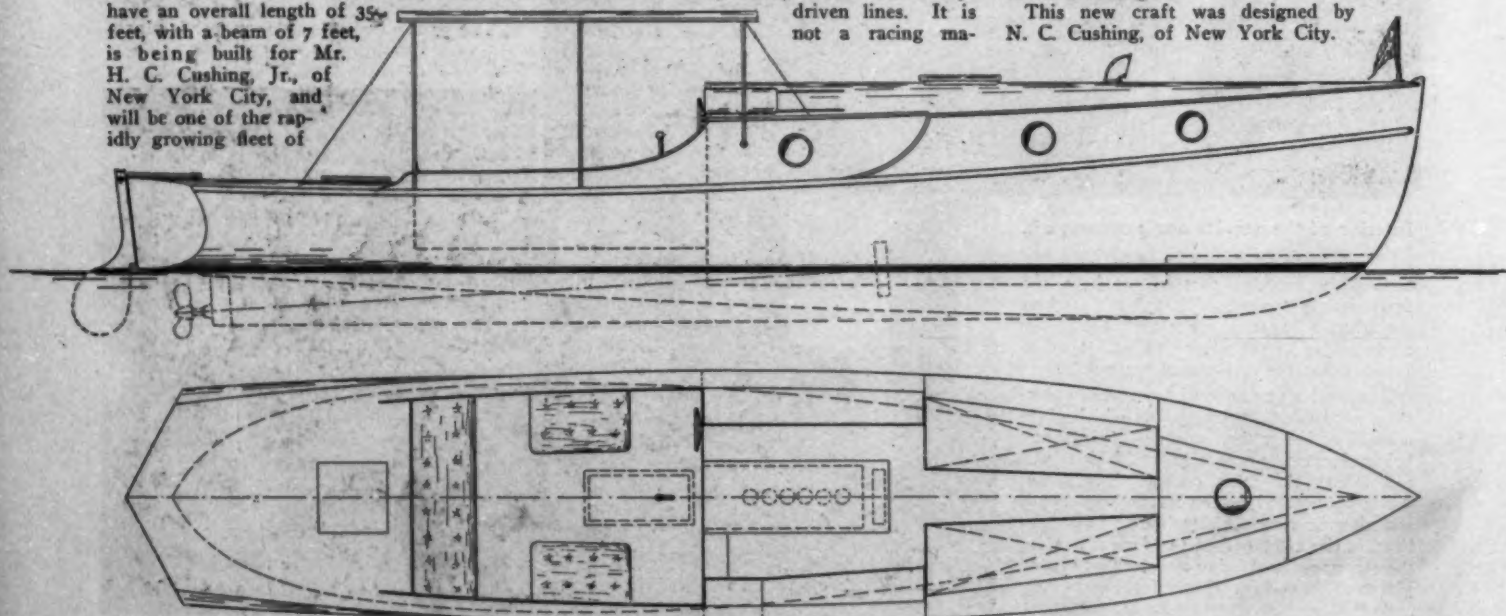
An Easily-Driven Craft, Strongly Constructed, with Full Cruising Accommodations for 4 People. An Enlargement of the Runabout Adelaide, But Not a Racing Machine in Any Sense of the Word.

THE accompanying illustrations show the design of one of the first of the new fast cruisers now building for the season of 1915, at the yards of William E. Haff, New Rochelle, N. Y. This new cruiser, which will have an overall length of 35 feet, with a beam of 7 feet, is being built for Mr. H. C. Cushing, Jr., of New York City, and will be one of the rapidly growing fleet of

the Huguenot Yacht Club of New Rochelle. It is an enlargement of Mr. Cushing's fast runabout, Adelaide, and its power plant will be a 70 h.p. Wisconsin engine. This new cruiser has exceptionally clean and easily-driven lines. It is not a racing ma-

chine in any sense of the word, being strongly constructed with full cruising accommodations for four people. The boat which has 3/4-inch finished cedar planking will be copper-fastened throughout.

This new craft was designed by N. C. Cushing, of New York City.



A new cruiser which will be one of the Huguenot Y. C. Fleet, powered with a Wisconsin motor.

A French Canadian 72 Footer



LA SIRENE, designed and built by E. Therrein, of Montreal, for J. Versailles, also of that city, is one of the best built and equipped motor yachts afloat in Eastern Canada. She measures 72 by 14 feet, and her 6-cylinder Sterling engine drives her easily and gracefully through the water at the rate of 13½ m.p.h. The frame is of clear white oak, and the planking of selected cypress, while she is finished throughout in mahogany, and all fastenings are of copper over burrs. All fittings and trimmings are nickel-plated, and the engine-room shines like the deck brightwork.

The owner's quarters are hand-



The engine-room contains, in addition to the big six-cylinder Sterling, a 6 h.p. Ferro motor for operating the dynamo. The electric outfit was made especially for La Sirene.

somely and luxuriously fitted out. The interior is of highly-polished mahogany, with dull white enamel ceiling, with the beams all of mahogany. Forward of the main saloon is a good-sized stateroom on either side, completely equipped, and aft of this compartment are the owner's quarters proper. On the starboard side is a large stateroom and opposite it a well-appointed toilet, equipped with bath and hot and cold water. The hot water is obtained from the overflow of the motor. There are wardrobe lockers, bureau, etc., in the owner's double stateroom, which also has a private toilet attached.



Photographs by Chesernold & McLaren.

The interior of La Sirene's main saloon, looking forward. This compartment is fitted out with large china closets, folding table, player piano, electric fans, etc. All the furnishings and fittings are of luxurious type.

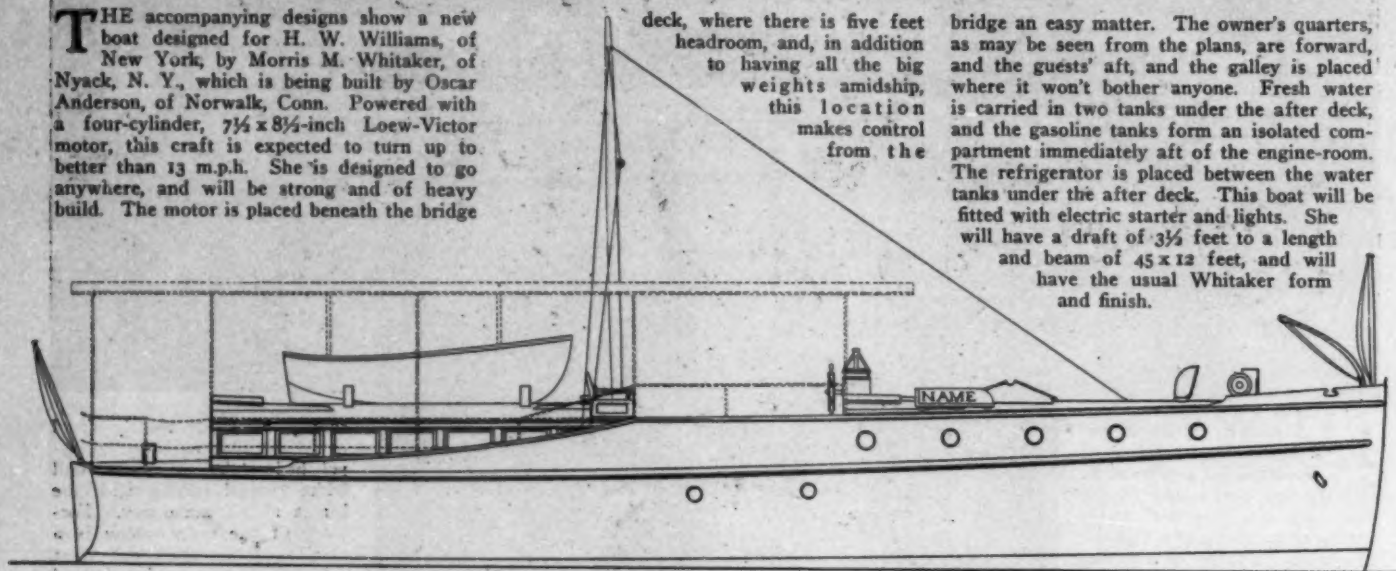
A Bridge-Deck 45-Footer.

A 13-Mile Cruiser of Strong and Heavy Construction Designed to Go Wherever She Is Sent. Having Motor Placed Beneath the Bridge to Center the Big Weights and Facilitate Control.

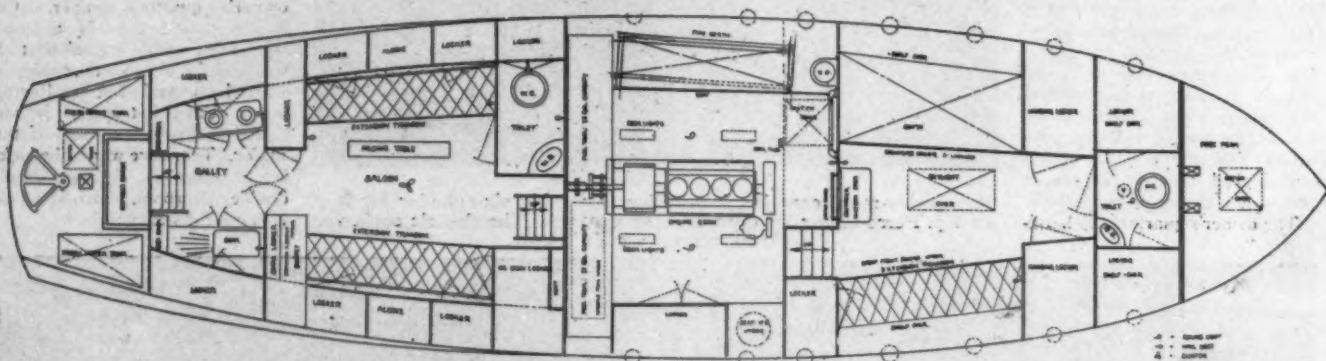
THE accompanying designs show a new boat designed for H. W. Williams, of New York, by Morris M. Whitaker, of Nyack, N. Y., which is being built by Oscar Anderson, of Norwalk, Conn. Powered with a four-cylinder, $7\frac{1}{2} \times 8\frac{1}{2}$ -inch Loew-Victor motor, this craft is expected to turn up to better than 13 m.p.h. She is designed to go anywhere, and will be strong and of heavy build. The motor is placed beneath the bridge

deck, where there is five feet headroom, and, in addition to having all the big weights amidship, this location makes control from the

bridge an easy matter. The owner's quarters, as may be seen from the plans, are forward, and the guests' aft, and the galley is placed where it won't bother anyone. Fresh water is carried in two tanks under the after deck, and the gasoline tanks form an isolated compartment immediately aft of the engine-room. The refrigerator is placed between the water tanks under the after deck. This boat will be fitted with electric starter and lights. She will have a draft of $3\frac{1}{2}$ feet to a length and beam of 45×12 feet, and will have the usual Whitaker form and finish.



Outboard profile of H. W. Williams' 45-foot cruiser.



In this Whitaker model the galley is placed at the after end of the boat where it is out of the way.

Flying Eagle, a Fast Runabout.

Built of Mahogany with Sides of One Piece, and Like the Stern Transom, Brass-Screwed. Speed of 22 Miles Obtained from 2-Cycle Motor Installed Under the Forward Deck.

FLYING EAGLE, shown in the accompanying photograph, is a 16-foot, 4-passenger runabout, having a beam of 4 feet 3 inches, and a guaranteed speed of 22 miles per hour, with a comparatively low rating under the American Power Boat Association rules. She is a product of Adolph Apel's, of the Ventnor Boat Works, Atlantic City, N. J.

This speedy little craft is built of selected mahogany, with sides of one piece, and, like the stern transom, all brass-screwed. The guards are of selected white oak, and there are runners of polished brass for the protec-

tion of the bottom. The rudder is of polished bronze, and equipment includes brass steering-wheel, tiller, and deck hardware, consisting of brackets, cleats, chocks and flagpole sockets.

The boat is finished in natural colors inside and out, filled and varnished with at least four coats of best spar varnish, and rubbed between coats.

The cockpit is laid out with two cross seats, cushioned, and with the after seat fitted with a lazyback. The steering-wheel is placed on the starboard side and the engine and reverse controls are handy to the helmsman. The motor, which is a Model 2-O, 12-14 h.p. Eagle with

reverse gear and ratchet controls, is placed under the forward deck, the mahogany engine cover being so designed that it is absolutely waterproof. There is a locker under the forward deck, and additional stowage space is provided under the thwarts.

This boat, which is issued as a stock model, is sold for \$600, or, if desired, it may be equipped with air tanks to make it unsinkable at an additional cost of \$15. Further equipment consists of bronze hoisting ring-bolts, to adapt the boat for use as a yacht tender, and these fittings are supplied at an extra cost of \$7.50.



This 16-foot Apel creation is designed to seat four persons. The wheel is placed on the starboard side with all engine controls handy.

PRIZE CONTEST in Questions and Answers

Changes in Cabin Arrangement.

What the Experience of the Past Season Has Suggested to Increase the Cruising Comfort. Details in Regard to the Interior Arrangement of a Cruiser Which Should be Given Attention.

THE PRIZE CONTEST: Answers to the First Question in the November Issue.

To Increase the Cruising Comforts.

(Prize-Winning Answer.)

OLD Noah Webster defines comfort as "a state of quiet enjoyment." I purchased a motor boat of good, solid, roomy lines, 35'x9½', last spring; used it all summer and now am having my winter fun planning improvements to reach that state.

There is a lazarette under the lazy seat at the stern end of the cockpit. When I wanted to serve anything I had to "shoo" my guests from the seat—lift up the cushion, brace it against my head while I lifted up the wooden seat and the tin cover of the lazarette and reached out the articles wanted.

To overcome this I bought a substantial little ice box, 27"x23"x17½" that will fit under the cooking shelf in the galley and drain outboard.

I will use the old lazarette for life preservers and spare ropes. They are now kept in the bow under the gas tank—a fine (?) place with the boat on fire!

The galley shelf under which I put the new ice box is painted, and always looks dirty. I am covering it with zinc sheeting like that used on kitchen tables and putting a sink and pump at one end.

The dishes have been in three shelves in the galley. In heavy weather they rattled and sometimes broke, besides, did not look "ship-py." A dish rack right above the zinc cooking shelf will be handier. I will cover the dish rack with a light curtain to keep out dust.

The tools are now kept in one of the companionway stairs. I will use the shelves vacated by the dishes for the tools and spare parts (many of which I have had to keep in the main cabin).

Putting oil in the crank case was inconvenient. I had to take off the engine cover and put a funnel in the "breather" and pour the oil in. This was dirty and difficult. I am fastening a long, narrow oil tank (5 gallons) in the lavatory with a sight gauge marked by pints, connected under the floor of the cockpit with the "breather." Next year all I will have to do to put a pint of oil in the crank case is to open the cock in the tank and watch the gauge. This tank is made long and narrow to make the graduations on the gauge farther apart. It will be filled through deck plate in the upper deck.

Last year I carried an ordinary five-gallon oil can in the hold under the cockpit. It was hard to get out.

Because there was no clothes locker, I had to hang coats on the sides of the main cabin. I am building a locker about one foot wide inside, running abeam. The door of the locker will swing out over the seats because the extension berths would interfere with the door when they are out. The locker, inside, will extend from the floor of the cabin to the roof. One can get into it by stepping over the 16" high seat, and so get to the gas tank. Coats can be hung from hangers on each side of the entrance. I will extend an electric light into it. These improvements are simple, but will save much annoyance next year.

F. G. R., Chicago, Ill.

Based on Six Years' Experience.

I HAVE been an enthusiastic follower of the sport for the past five or six years, having owned four boats during that time, my present boat being a 25-foot cruiser. As every motor boatman knows the work on his boat does not stop when it is launched, nor even after the trial spin, but seems to go on as long as he owns it, and there are always a number of changes in arrangement and equipment to be made from one season to the next. The improvements which I contemplate making during the winter months outside of the usual cleaning and painting are as follows:

First: For fear of having my anchors disappear in some unknown fashion during the night I have always carried them in the stern of my boat under the after deck, together with anchor lines and other numerous articles, where they seemed to acquire the habit of getting underneath everything else, and when the time came to get one in a hurry, as it frequently does, it would be necessary to remove the entire contents of the locker to do so. Next season these anchors will be stowed on deck and locked down in blocks such as were described in a recent issue of MoToR Boating, where they will always be ready for instant use. I shall also get about 50 or 60 feet of quarter-inch galvanized chain for use with the light anchor so that it will not be necessary to have a coil of wet, muddy rope to handle, as the chain can be instantly stowed in the chain locker without waiting for it to dry. Most every boatman knows the result of stowing a wet line in a locker along with other stuff.

Second: My rudder post and tiller are located under the after deck. On one occasion my steering cable parted and I found it very inconvenient to reach back under the deck to steer the boat until I could make repairs. I shall put in a long rudder post next season so that I can have the tiller and steering cable on deck. My steering wheel has heretofore been located on the port side of the cabin bulkhead, but I think it will be easier to steer a straight course if I should place the wheel in the center where it should be.

Third: The cockpit floor has no crown to it and the floor beams have sagged in the center, thus allowing a pool of water to accumulate in rainy weather. I think it will be well worth the trouble to put in beams which have a little crown

Questions for the March Issue.

1. Discuss the advantages and disadvantages of the outboard rudder on cruisers up to 50 feet in length.

(Suggested by S. G. Tiffany, Vancouver, B. C.)

2. Describe the best and most economical method of construction for a permanent landing stage to be used for motor boats, in sufficient water, mud bottom, and where ice is to be considered in the winter time.

(Suggested by H. B. Breckwedel, Chestertown, Md.)

3. Give a simple home-made device for readily determining the amount of gasoline in a tank at any time.

(Suggested by R. M. Loring, Sheffield, Mass.)

RULES FOR THE CONTEST

Answers to these questions, addressed to the Editor of MoToR Boating, 119 West 40th St., New York, must be (a) in our hands on or before January 25, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 25th of January.

The prizes are: For each of the best answers to the questions above, any article advertised in the current issue of MoToR Boating, of which the advertised price does not exceed \$25, or a credit of \$25 on any article advertised in the current issue of MoToR Boating which sells for more than that amount. (There are three prizes—one for each question—and a contestant need send in an answer to but one if he does not care to answer all three.)

For each of the questions selected for use in the next contest, any article advertised in this issue of MoToR Boating, of which the advertised price does not exceed \$5, or a credit of \$5 on any article advertised in this issue of MoToR Boating which sells for more than that amount.

When you send in your answers you must state what you will take for a prize, should you win one.

to them and re-lay the floor. This will cause the water to flow towards the scuppers.

Fourth: My gasoline supply is contained in two galvanized tanks, one under the forward deck and the other under the bridge deck at the forward end of the cockpit. The builder never seemed to realize that they might possibly need cleaning at some future time so he built them in to stay. I had more trouble with dirty gasoline last season than anything else, due, I think, to the fact that these tanks have never been cleaned out since they were installed three years ago. I shall proceed to "dig" them out and give them a thorough renovating, after which I shall run the copper supply pipes direct to the carburetor instead of making the gasoline travel all around the boat on a sort of "joy ride."

Fifth: Have you ever tried to sleep in a berth that was so narrow that it was necessary to tie yourself in for fear of being thrown out should a steamer pass during the night? It is not very comfortable, I assure you, so for next season I am going to make these berths wider and get along with less floor space in the cabin.

And lastly, to make things comfortable during those chilly evenings of early spring and fall, I shall install a small ship's coal range. There is nothing like coming into a warm cosy cabin after being outside for three or four hours on a cold rainy day. These improvements I think will add materially to the cruising comfort of my boat.

A. W. LEEMAN, Washington, D. C.

Some Power Plant and Equipment Changes.

THE following changes suggested are not for next year so far as the writer is concerned, for they have already been made and tried out, and so their recommendation is based on experience.

Probably every motor boat leaks at least a little or else rain water gets in in some way. At

any rate we have never seen one with a dusty bilge and our own has leaked enough, especially when running, to have required the frequent use of a pump. A small bilge pump connected with the engine shaft has done away with this discomfort, for it keeps the bilge dry when running and soon removes whatever water accumulates during such days as the boat is not in use.

Another cause of frequent annoyance has been the corrosion of wire joints, battery terminals and switch connections. These have all been soldered and that trouble removed permanently.

We have a two-cycle engine and have found that putting a half pint of cylinder oil in the tank with each five gallons of gasoline, has given excellent results and has done away with nearly all of the dirty work of oiling by hand or of adjusting oil cups which had frequently failed to do their duty.

An inexpensive filter installed near the gasoline tank has effectively caught such water as has managed to get into the tank and kept it out of the carburetor.

We don't use kerosene any more because we have found the benefits of electric lights in the cabin and for the running lights, has far outweighed the initial cost. This cost is not prohibitive, and in fact a few extra sets of dry batteries, with care, will supply all the current necessary.

Army ponchos have proven to be a profitable investment for they can be used not only as rain coats, but to cover certain parts of the cargo and as blankets for those who have to sleep under the cockpit awning or under an unexpected leaky spot in the cabin during wet weather.

We have found that ordinary Mason jars are handy for keeping such things as sugar, salt, coffee and cereals.

A small anchor has proven to be a great convenience—one not large enough to hold the boat in a storm or in an exposed place—but just large enough to hold while luncheon is served or to be used for the night in well-sheltered harbors. The "breaking" of a large anchor is no cinch, and the little one may be

used in addition to the big one during hard blows and comes in handy for a stern line occasionally.

CRUISER, N. Y. C.

Changes in an Open Boat.

AT least two important things will be done this winter with a view toward comfort and convenience.

One is the seating arrangement. At present there is a cross seat forward—also one aft, the space between being occupied by chairs. To get to the forward seat you have to climb over it.

The improvement will be to cut a section out of the front seat on the starboard side to allow a free passageway. Also to provide locker seats—one on each side about 16"x36" to take the place of chairs. Chairs are probably more comfortable but they have no lockers under them to stow away that awful lot of stuff you have on a boat, hence the lockers. One will hold the life preservers—the other some odds and ends and a small ice chest.

The other important improvement will consist in making a hole in the canvas top to facilitate getting in and out of the boat.

The present top is the common cruiser type bent pipes, wood slats and canvas covered, quite heavy and substantial, but it is not far enough above the coaming to get through easily. Hence about half way along one side an opening about 12"x24" will be cut—run a small coaming about an inch above the top around the three sides and hinge a door made of slate canvas, convex similar to the top so that it will fall back onto the top when opened, but will be fairly waterproof when closed. This opening will give a clear headroom as you step up to go over the side.

Several minor improvements will be made, among them a series of hooks and cleats in the engine compartment so that all wrenches, screw drivers, etc., can be hung up and easily discovered when wanted. Another, to bring all the switches to some easily accessible point.

L. R. K., Philadelphia, Pa.

Fastening the Frames and Floors.

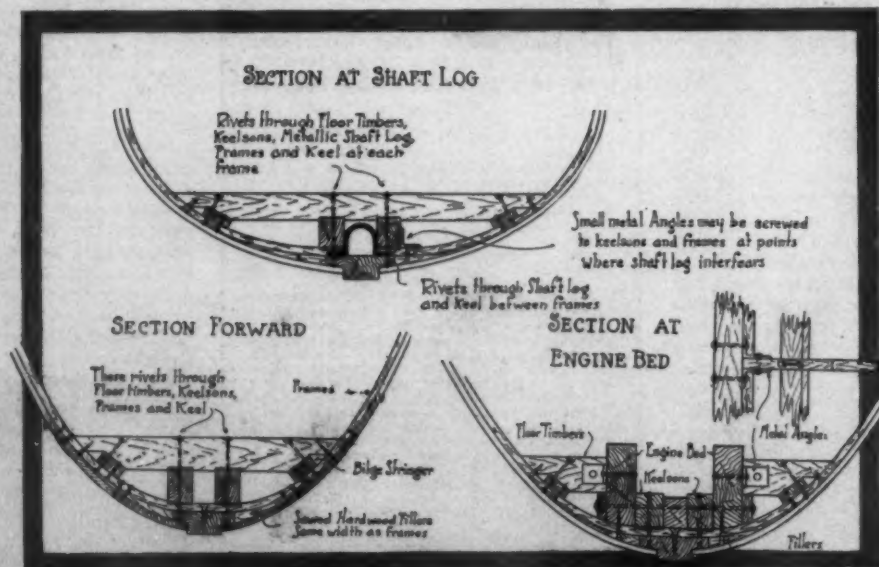
Several Methods Explained and Illustrated for Attaching These Members for Greatest Strength. Suggested Schemes for Fastening the Frames to the Keel in the Different Types of Boats.

THE PRIZE CONTEST: Answers to the Second Question in the November Issue.

For a Runabout.

(The Prize-Winning Answer.)

IN AN effort to convey my idea of what I have found to be very rigid and satisfactory fastenings between floor timbers, frames, keel, etc., I have chosen for an example a boat of the runabout type twenty to thirty feet long with about a five-foot beam, but with a few slight changes it could be used in most any reasonable size or type of boat.



Mr. Wright's several methods used in a small runabout.

The most important points to be considered are strength and rigidity and next, ease of construction, but most of us would rather spend a little more time and get a first-class job in the end.

Since forces act in triangles, it will be necessary to resist them with triangles, as is done in roof trusses, cantilever or suspension bridges, the rigidity of these structures depending on the fastenings at the corners or points of the angles. Now, we will apply these rules to the frames of our

boat—the floor timbers form one side of the triangle, the frame the other side and the keelson closes the angle, giving us one complete triangle on each side of the keel at every fl

As before mentioned, the triangles are of no value without rigid connections at the corners, so we must provide ample fastenings at the joints.

In building a frame of this kind the keel is laid as usual and the frames bent into place between battens and fastened to the keel with one screw each; the bilge stringers are then fitted to place and fastened to the frames with a rivet at each connection; the keelsons are next and are notched to receive frames and floor timbers. After fitting they are clamped in place and the floor timbers are fitted one at a time and riveted through keel, frames and keelsons at the center and another rivet through each bilge stringer and frame at each end of floor timbers.

A hardwood filler the same width as the frame fills out the space between the frames, keel and planking; this also strengthens the hull at each side of the keel. The fastenings can be either bolts or rivets, preferably copper rivets and washers; if bolts are used, spring washers should be used under the nuts.

Ash makes excellent floor timbers, keelsons and bilge stringers, while oak is better for frames and keel.

Ordinarily, the shape of the boat requires the keelsons to be about twice their thickness in depth at the forward end and about square at the after end.

The engine bed is riveted or bolted to the keelsons and screwed to the frames, the floor timbers being fastened to the bed with small metal angles secured with rivets.

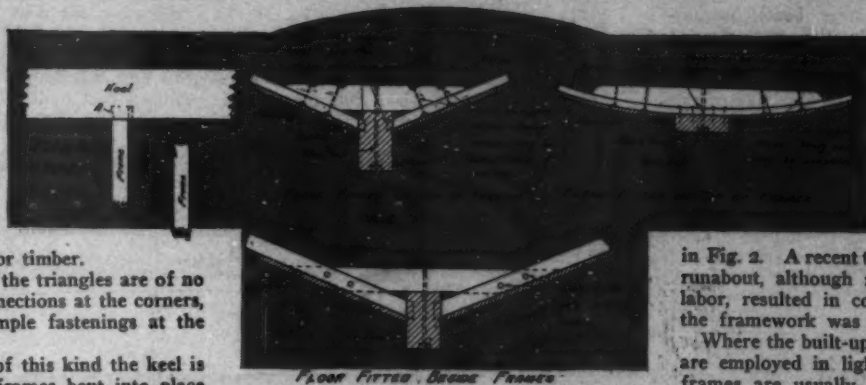
The frames are cut away at the shaft log, but are securely riveted in place. By referring to the drawings, it will be seen that all fastenings in the framing are put in before the planking is put in place, which leaves no rivet heads to work loose and cause a leak.

A floor timber at every other frame will give the desired stiffness for most any condition, while a timber at every third frame will answer where light power is to be used on protected waters, but in either case frames should be riveted through keel and keelsons at points where no floor timbers are used.

M. A. W., So. St. Paul, Minn.

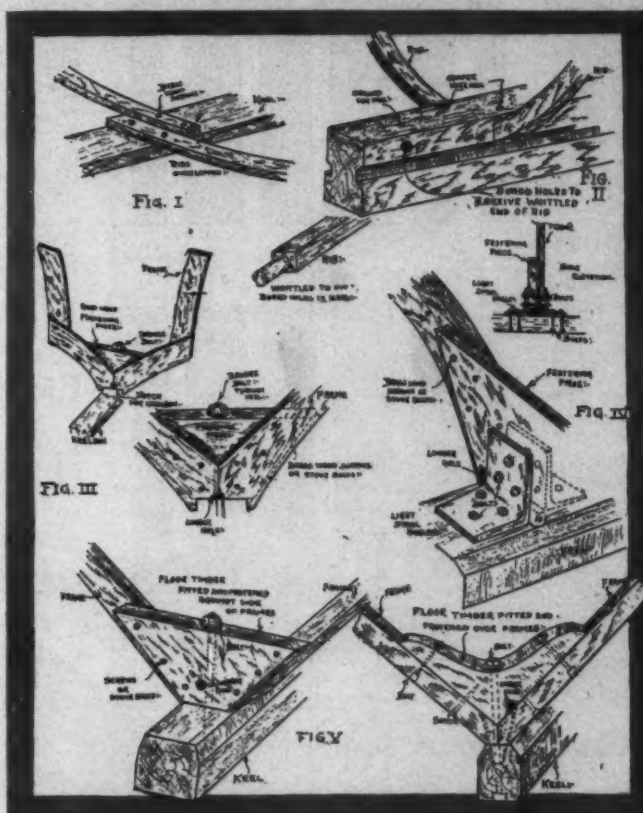
Several Methods of Fitting Floors.

PROPER methods of frame fastening and floor timber fitting are important details of motor boat construction. Of course the manner of joining the frames to the keel will depend greatly upon the size of boat and type of keel.



Methods suggested by Mr. Parks for use with different types of keels.

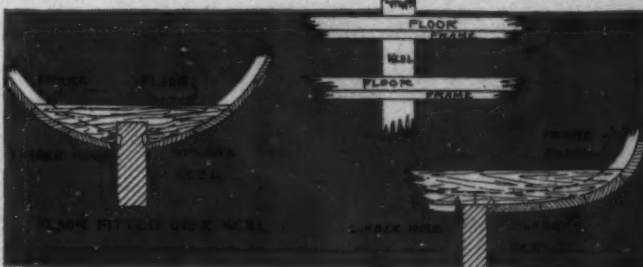
For small boats of light bent frame construction where the flat type of keel or keelson is used the easiest and best method is to



Mr. Bradley's most complete and practical methods to meet a number of different conditions.

allow the ribs to overlap each other, fastening with brass screws or copper rivets, as shown in Fig. 1.

For the same type of boat with a rabbeted keel a very good way is to bore horizontal



Details of methods suggested by Mr. Davis.

holes part way through the keel above the rabbet and whittle the ends of the ribs to a drive fit for these holes, fastening them with a copper nail as shown

in Fig. 2. A recent trial of this mode in a small runabout, although requiring somewhat more labor, resulted in complete satisfaction when the framework was completed.

Where the built-up frames of V-bottom type are employed in light construction the lower frames are usually notched to slip over the keelson and provided with a hard wood fastening piece fitted alongside. The lower sections are fastened to them with either wood screws or stove bolts supplied with washers. A long bolt extending up from the under side of the keel and through the fastening piece is generally the means of tying the frame fast in position, as has been indicated in Fig. 3.

For the same style of frames in heavier construction, light steel angles work in very nicely, bolting two together, one on either side of the fastening piece, through concentric holes and lag screwing, or bolting the angles to the keel, as illustrated in Fig. 4. With V frames built up thus, the fastening pieces also serve as the floor timbers.

Two ways of fitting and fastening floor timbers are clearly shown in Fig. 5. In the upper one the floor timber is fitted over the ribs and fastened with screws and bolts, and in the lower one the "floor" butts against the side of the ribs and is fastened with screws or small stove bolts and one long bolt. Either method is to be desired, and neither is possessed of decided advantages over the other.

Limber holes should be bored through the floor timbers to allow bilge water to flow from one "pocket" to the other.

C. E. B., Fall River, Mass.

**For Plank or Log
Keel, Shallow or
Deep Frame.**

THE method of fastening frames to the keel and the floor timbers to the frames and keel, depends, of course, on the construction of the boat, but the methods described and shown in the accompanying sketches will be found applicable to most cases and are undoubtedly as simple as can be built.

In attaching the frames to a plank keel, which is sometimes used in small boats, about the best method is to butt the heels of the frames together at the center of keel, chamfering the bottoms off so that they will meet the keel fairly as shown in Fig. 3, and then secure the frames to the keel with a couple of galvanized boat nails, or better, brass screws. With the heavy log keel which is almost invariably used

with large boats, unquestionably the strongest method is to mortise the heels of the frames into the keel, as shown in Fig. 1. One side of the mortise in the keel should be cut with a bevel, as shown at A, and the heel of the frame notched to fit, as shown at B. Then, when the frame is laid into the mortise and a wedge inserted, as shown, a very strong connection is obtained, for almost the full strength of the frame is developed. It is well to put a copious dab of red lead in the mortise before placing the frame in position, as this will protect the joint from dampness and prolong the life of the timber.

In fitting floors to frames and keel, the method depends on whether the frame is shallow as is used where the frames are steam bent or a deep frame as used in V-bottom boats, or a sawn frame. With the shallow frame, fit as shown in figure 3 or 2.

B. A. PARKS, Grand Rapids, Mich.

The Strength of the Boat Depends upon the Floors.

FRAMES are secured to the keel by screws or nails. Whether they are bent in one continuous length or butted on the keel makes little difference in the method of fastening. Where it is necessary to box the frames into the keel as at the stem and stern, galvanized cut nails are sufficient, but they should be bored for to prevent splitting.

Due to this unavoidable insecure fastening it is necessary to use sawed floors to effectually tie the boat together at its most vital part. Frame stock cannot always be bought long enough to bend the full girth of the boat, so butting on the keel cannot be avoided. The chief value of the floors is to compensate for this weakness. They prevent racking and undue straining. Vibration is considerably reduced by fitting a good number of floors. The usual practice among good builders is to fit a stout oak floor alongside every other frame. In the way of the engine bed they should be heavier and closer. In any case, carry them as far out into the bilges as possible. Leave the tops straight as shown, and use oak. About one and one-quarter to one and a half inches is about the right thickness for, say, a 30-footer.

Some prefer to fit the floors before planking, while others think it easier to wait until the planking is at least partly done. In the latter case, use a pair of pencil dividers to transfer the shape to the piece of oak, first fitting it partly down over the keel. Before the planks are on it is simple enough to let the piece over the keel, clamp it to the frame and mark along the bottom of frame. Always fit the floors so they lie snugly to the planks. Fasten up through the plank with screws or galvanized nails. It is not necessary to rivet the floors. One or two good stout screws are sufficient to hold it to the keel.

C. D. DAVIS,
Marblehead, Mass.

Strong and Simple.

FOR strength, which is the first requisite in the construction of any boat; for simplicity in building, which cuts the cost of building, and for lightness, which, in many

rabbit for the edge of the garboard strake. The heels of the frames are fitted on this and fastened with galvanized boat nails. In fitting the frames one must be careful that they are practically square

across the keel and in line, also parallel, with each neighbor. Should the boat be of small size, the frames should extend from deck to deck. A keelson is placed over the frames for the entire length of the keel. Floors placed on alternate frames are sufficient unless the spacing is over 12 inches. In that case they should

be on every one. Jog them over the keelson, as shown, and cut them with enough height to extend well out to the bilges. Galvanized bolts countersunk in through the bottom of the keel and extending through everything to the top of the floors will hold all secure. Copper or galvanized rivets through the frames and floors, two or three each side, are sufficient to hold the ends. The keelson should be fastened between the floors, where floors are on alternate frames, with galvanized boat nails or screws.

When the garboard strake is fastened into position, a small triangular opening is left, which serves as a limber, for the passage of bilge water.

WILLIAM ATKIN, Huntington, L. I.

Fastenings for a V-Bottom.

THE diagram shows a method of fastening the frames and the floors to the keel, which has been followed in the construction of a large V-bottom cruiser, that is expected to be used where the elements of nature will not always be favorable to a small motor boat.

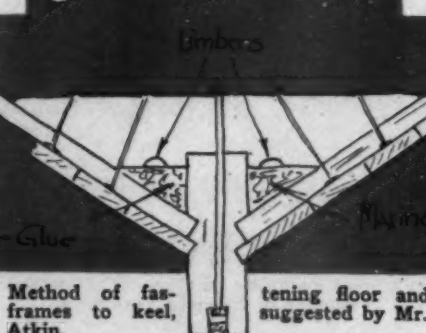
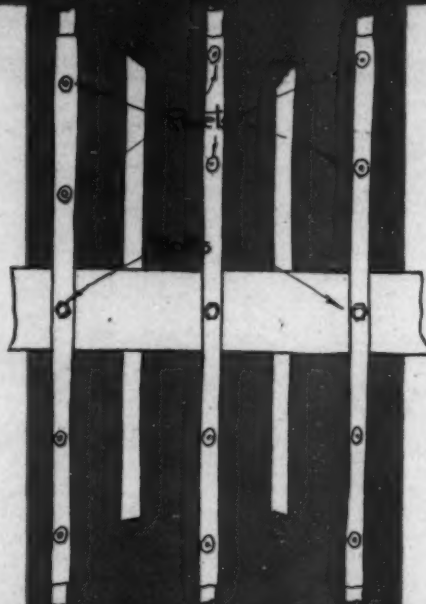
The keel may be a built-up or a single-piece keel. As shown in the sketch, the top edge of the keel is used as the back rabbet, and the top edge of the layboard is the beading line. This makes the cutting of the rabbet very simple. The layboard and the keel are fastened together with galvanized iron boat nails. These nails should be driven between the floors and the frames so as not to interfere with the door fastening.

The bottom of the frames are cut on a bevel to allow them to set square on the layboard. These are fastened to the layboard with galvanized iron boat nails.

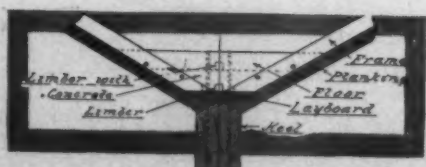
The pieces for the floors are laid on edge, across the layboard and are scribed along the frames. The lumber is marked and then the floor can be sawed out. The floors are fastened to the frames by two or more galvanized iron boat nails driven through the floors and clinched or riveted on the frames. Two pieces of galvanized iron rod are driven through the floor, layboard and keel on each side of the limber.

This construction will hold good for any type or form of a boat using a keel. Of course, if concrete ballast is to be used the limber should then be cut higher on the floors, as shown by the dotted lines.

L. C. R., Nyack, N. Y.



craft is of importance, the accompanying sketches (a cross section, an elevation and plan view) show an excellent manner for fastening the frames, the floors and the keel.



L. C. R.'s V-bottom construction.

The top, or rabbet side of the keel, is fitted with a $\frac{1}{4}$ " to $\frac{3}{8}$ " thick plank, projecting $\frac{3}{8}$ " on each side, and forming, when in place, a

What to Use in the Bilge.

A Discussion of the Different Materials Suitable, with the Pros and Cons of Each.
Motor Boatmen Give Their Ideas Why Cement Should or Should Not Be Used.

THE PRIZE CONTEST: Answers to the Third Question in the November Issue.

Cement Should Be Waterproofed.

(Prize-Winning Answer.)

MANY cruisers of the present day, raised deck design, must carry considerable ballast to hold their proper trim and stability. In this case no substance is more highly recommended than waterproofed concrete or cement, which not only ballasts but stiffens the boat and distributes the motor vibration.

If the idea is solely to preserve the wood, a thorough treatment with creosote, carbolic oil or other preservative is much better.

A new boat in the building is easily treated by applying the preservative to the frame before planking and then when planked give the bilge another coat. It would be a good plan to cover all parts before setting up if convenient. Carbolic oil when thoroughly dry will take paint all right, but, why paint?

After a few years apply another coat of preservative and always have a clean, sweet-smelling bilge.

Concrete for the bilge of a boat should by all means be waterproofed by the integral process, i. e., mixing in a waterproofing compound when the concrete is mixed. If concrete becomes watersoaked, as ordinary concrete will if in water, and in turn frozen, the expansion becomes sufficiently great to crack it after repeated freezing and thawing. Cracks will spoil the stiffening effect on the boat and in time disintegrate the concrete.

To waterproof concrete it is necessary that the material forming same be properly proportioned to form a dense mass. The waterproofing (a white powder) should be added to the cement dry and well mixed, before adding water. Then add the sand, wet and mix thoroughly, then the stone and additional water necessary for a very wet mixture. The quality of sand used is of utmost importance. Care should be exercised to secure that which is clean sharp, and contains not over 8% impurities. Beach sand will not do, as it is not sharp, the edges having been worn off by the action of the waves.

Either cracked stone or clean gravel may be used. If figuring for ballast remember that concrete weighs approximately 130 pounds per cubic foot. A mixture composed of one part (waterproof) cement, two parts sand and three parts stone will be found very satisfactory for this purpose.

Before pouring the concrete wash the bilge thoroughly with a strong soda solution and when dry treat with the preservative already mentioned. "Scout up" all the old copper and brass nails, screws, heavy wire, etc., and drive them into the keel and frames where the concrete is to be poured. These will hold the concrete firmly to the boat frame.

Provision should also be made at this time for pumping out. A wooden box or possibly two, depending upon conditions, should be placed at the lowest point to form a well in the concrete to collect the bilge water and facilitate pumping out.

We all know that the bilge of a boat cannot be kept dry, but with the frame treated with preservative and then filled around with waterproofed concrete everything to secure long life and rigidity or stiffness has been done.

W. B. M., Newburgh,
N. Y.

Five Reasons for Using Cement.

THERE are five reasons for the use of cement or similar material in a boat's bilge. First, for ballast. Second, to secure cleanliness and freedom from gasoline leakage in the bilge by providing a surface which will drain to a "well" where the pump may reach it. Third, to strengthen or stiffen a fragile hull. Fourth, to diminish the vibration of the hull caused by the motor. Fifth, to prevent leaks.

Pitch is another material which is used for similar purposes and this sometimes has a two-inch coating of cement over the top to protect the less durable material beneath.

Considering the above uses in the order given, we find that cement is heavy enough to make effective ballast, since it weighs about 125 lbs. to the cubic foot. It lies close to frames and planking in the lower part of the hull and it cannot shift. It provides a smooth, level surface beneath the cabin flooring in place of timbers, planking and keelson which every motor boatman knows are difficult to keep free from bilge water, oil and dirt. A "sump" or "well" may easily be cast in the material (while in a plastic condition) to collect the bilge water and to this "well" the suction pipe from the bilge pump should be led.

Cementing the bilge will stiffen the structure of a hull to some extent, although it cannot actually strengthen it. The true strength of any hull must be dependent upon the condition of timbers and planking and their fastenings. As an absorbent of vibration a heavy mass of cement in a boat's bottom is remarkably effective. In some cases motors have been bedded upon a concrete foundation cast under the motor while it was held exactly in line by temporary supports. The hold-down bolts were cast solidly into the mass and the method is said to be entirely practical. The absence of vibration is one of its strongest "talking points."

As a cure for leaks cement is quite effective, since, if it does not stop leakage altogether, it will reduce it to very moderate proportions. Some home-built boats which leak everywhere at once and have been given up as incurable have regained a long lease of life after a good dose of the "cement cure."

Cement in a boat's bottom has the disadvantage of concealing the actual condition of the timbers and fastenings, and being very hard to remove renders repairs extremely difficult and in some cases impossible. Pitch, on the other hand, may rapidly be cut out to get at weakened or injured timbers and is in this respect a desirable material to use. Its relatively light weight, however (about 72 lbs. to the cubic foot), renders it less effective than cement for ballast and it never has achieved any considerable popularity.

For many years the fast-sailing schooners of the New England fishing fleet have used cement for ballast, sometimes adding boiler punchings to the mixture to increase its weight. Pleasure boatmen have now adopted the idea for one reason or another, usually with good success. The writer has done considerable sailing the past few seasons in a motor boat having a cemented bilge and has never experienced any difficulty traceable to this form of ballast.

Before putting in the cement, clean out the bilge thoroughly and paint it thickly with white

lead. If the boat is afloat see that she is properly trimmed, and if on shore block her up so that her water line is perfectly level. Prepare the mixture as follows: Mix one part best Portland cement with two parts sharp sand and add enough water to bring to the consistency of thick porridge. Before the surface hardens make the well for the bilge pump suction, and slope the surface slightly toward it from all directions.

A. O. G., Portland, Maine.

Suggest a Paint and Sand Paste.

IN regard to the policy of using cement or plastic material in the bilge of a boat. I have tried cement and find it to be a poor thing to use in a boat as it will not stick tight to the wood, when the cement is soft it swells the wood and while the wood is swelled up the cement sets and when the wood dries out there is a crack between the two which will always be wet and damp, causing it to rot very soon. The best thing to use is a stiff paste made from paint and sand or paint and cinders, cinders screened through a 3/4-inch mesh screen. This paste will soon become hard and never let loose from the wood. I have used this material for nine years and it has never let loose. When you try to get it loose you will find that the wood will come with it.

H. J. W., Dixon, Ill.

Recommends a Bitumastic Compound.

AN ordinary mixture of cement and sand, as has sometimes been used, is not suitable for putting in the bilges and bottom of a boat, as it has a tendency to crack and loosen up whenever the boat undergoes a strain, allowing the bilge-water to seep into these cracks and rot the wood. Its weight is also large, which must be considered if cost of propulsion is wanted as low as possible.

The best thing to use is a bitumastic cement with an enamel coat. These two form a plastic cover or coating which is very adhesive and penetrating. In any place which is inaccessible for painting, the use of this preparation is advised.

The surface to be covered must be thoroughly cleaned of any dirt, grease, moisture, etc., and given a coating of bitumastic solution applied cold. After being allowed to dry for 24 hours, a bitumastic enamel is added, applied hot (375° F.) and well brushed on. As those two coatings are chemically alike, they combine and form a hard and elastic coat which is not only impervious but very nearly indestructible. The weight of these two coatings is about one-fifth of ordinary cement.

A covering of this kind is used, in place of paint, extensively in large ships, both in the merchant service as well as in our navy. It is also employed in covering the underwater portion, both inside and out of dry docks, the dry dock (Dewey, P. I.) being an example, and more than three million square feet of the lock gates of Panama are protected in this way.

W. M. M., Dubuque,
Iowa.



AMERICAN MARINE MOTORS



A New Peerless in Two Sizes.

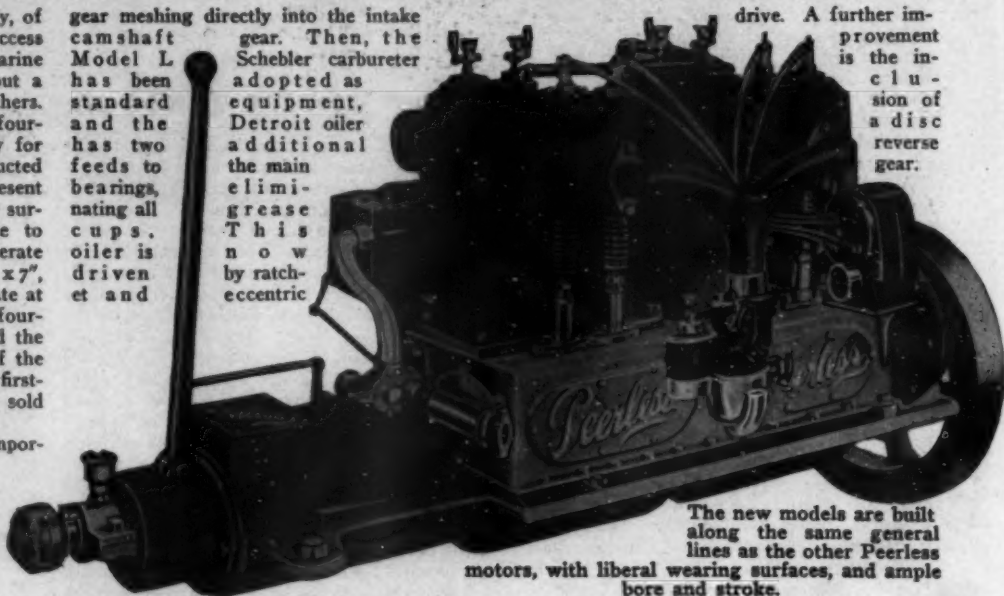
In Two and Four Cylinders, and of Larger Power Than the Old Models, Having $5\frac{3}{4}$ " x 7" Cylinders. Many Improvements in Other Motors of This Line, Affecting Carburetion, Lubrication, etc.

THE Peerless Marine Motor Company, of Buffalo, N. Y., announce that the success of their present line of Peerless marine motors has made it possible to bring out a new engine of larger power than the others. This new engine is built in both two and four-cylinder types, and is designed especially for cruising and work boats. It is constructed along the same general lines as the present Peerless engines, and has liberal wearing surfaces, and also ample bore and stroke to deliver its rated horsepower at moderate speeds. The cylinder dimensions are $5\frac{3}{4}$ " x 7", and the two models are designed to operate at a speed of from 350 to 500 r.p.m. The four-cylinder model is rated at 40-50 h.p., and the two at 20-24. These engines are built of the highest grade materials, equipped with first-class accessories throughout, and will be sold at characteristic Peerless popular prices.

In addition to the new models, many important changes have been effected in the old line for the new year. For instance, the location of the dual magneto has been changed from the rear to the forward part of the engine, and it will be driven by a spur

gear meshing directly into the intake camshaft gear. Then, the Schebler carburetor adopted as equipment, Detroit oiler additional the main eliminator grease. This now by ratch-eccentric

drive. A further improvement is the inclusion of a disc reverse gear.



The new models are built along the same general lines as the other Peerless motors, with liberal wearing surfaces, and ample bore and stroke.

The New Kermath Twenty.

A Compact Four-Cylinder Monobloc Machine Having a Speed Range of from 600 to 1,200 R. P. M. Constructed with Chrome Vanadium Crankshaft, Jacketed Exhaust and Intake Manifolds, etc.

THE Kermath Manufacturing Company, of Detroit, Mich., who have for a long time confined their attention to the production of the well-known 12 h.p., Ker-

math motor, have now broadened their field by producing the 20 h.p. machine shown in the accompanying illustration. This new model, like the 12 h.p., is a four-

cylinder, four-cycle engine, and by using an en bloc casting the weight is kept down to 440 pounds, and the design throughout is made neat and compact. The cylinders measure 4-inch bore by 4-inch stroke. The crankshaft is a chrome vanadium steel forging and the material used in the other parts is that which constant test and experiment have shown the makers to be best suited for the purpose. The bearing sizes are extremely liberal throughout, and the valves are of ample dimensions. The exhaust manifold is fully water-jacketed to do away with objectionable heat in the boat, and, by jacketing the inlet manifold as well, advantage is taken of the heat in the jacket to better vaporize the fuel and add to the efficiency of the motor.

The speed range of this new Kermath is from 600 to 1,200 revolutions per minute, and the manufacturers figure on the engine to handle a 20-inch diameter by 24-inch pitch, three-bladed propeller of wide blade area at 600 revolutions for cruisers, while it will handle smaller propellers for speed boats and runabouts of the family type. It is also stated to be a particularly good model for medium heavy-duty work, as it will operate at slow speeds. The makers are prepared to fit it with an extra heavy fly-wheel for this purpose. This motor is made as a unit power plant with Paragon reverse gear, or separate, as shown in the photograph.



The new 20-h. p. Kermath is furnished as a unit power plant, or without reverse gear, as shown above.

The New Model D Gray.

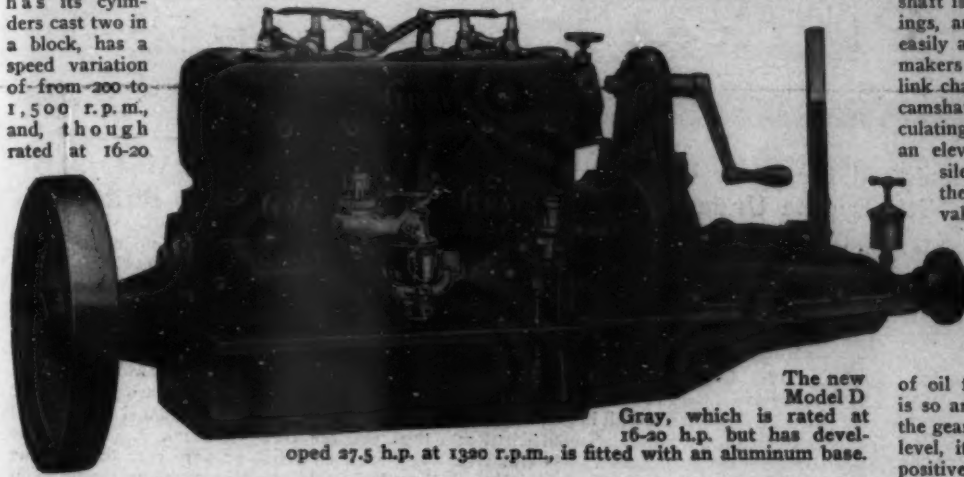
A Four-Cylinder, Four-Cycle, Silent-Running Marine Engine Adapted for Runabouts and Cruisers. Having Long Stroke, Extra Large Valves, Ample Bearing Surfaces and Aluminum Base.

THE Gray Motor Company, of Detroit, Mich., have recently come forward with a new $3\frac{3}{4} \times 4\frac{1}{2}$ " 4-cylinder, 4-cycle motor which is especially suitable for modern runabouts and cruisers. This machine, which has its cylinders cast two in a block, has a speed variation of from 200 to 1,500 r.p.m., and, though rated at 16-20

this new plant is its accessibility—it has big handhole plates on each side of the aluminum crankcase, enabling one to get at the bearings quickly, while the engine is so constructed that an ordinary wrench will reach any nut on it.

valve tappets reduces wear to a minimum. The camshaft, which is a one-piece forging, hardened and ground, both on bearings and cams, can be withdrawn from the crankcase through the forward or after end. The crankshaft is also removable through the end bearings, and the silent chain and sprockets are easily accessible in the outside housing. The makers call attention to the use of the silent link chain in this motor: one chain drives the camshaft and another operates the water-circulating pump and magneto shaft, while, when an elevated rear starter is supplied, another silent chain is fitted to a third sprocket on the clutch housing. Electrically-welded valves with hardened steel stems are used.

The oiling system is so arranged that the valve tappet mechanism operates continuously in oil. The valve tappet covering plates prevent any leakage of oil, and the forward main bearing is provided with an oil packing which prevents seepage of oil forward, while the after main bearing is so arranged that any excess oil drains into the gear case, whence, after reaching its proper level, it is returned to the oil reservoir. A positive pump circulating oiling system with sight feed is used. Ignition may be furnished either from dry cells and coil or by high-tension magneto. The water-jackets are cast integral with the exhaust and intake manifolds.



The new Model D Gray, which is rated at 16-20 h.p. but has developed 27.5 h.p. at 1320 r.p.m., is fitted with an aluminum base.

h.p., the makers state that at 1,000 r.p.m., it develops 21 h.p., while at 1,320 r.p.m., it puts forth 27.5 h.p., operating, withal, with the utmost quietness. One of the main features of

Particular attention has been paid to the balance of the reciprocating parts and the grinding of all wearing parts, while the use of large bearings and revolving mushroom

The Four-Cycle Ferro.

A New Line of Completely Equipped Unit Power Plants Which Embodies Many Distinctive Features. Having Overhead Valves, Detachable Head, En Bloc Casting, and Removable Cylinder Sleeves.

THE Ferro Machine and Foundry Company, of Cleveland, Ohio, have just introduced a line of 4-cycle engines, in which an unusual combination of features are apparent. The new type, which is of clean appearance, with practically all moving parts enclosed, is designed with detachable cylinder head, en bloc casting, overhead valves and removable cylinder sleeves. Many advantages are claimed for these features, the most unusual one of which is, perhaps, the removable cylinder sleeves. By this construction it is possible for the manufacturers to select a casting material with a view to strength and resistance, rather than to withstand wear, while it permits the use of a certain grade in the cylinder lining more desirable than the grade of metal which can be used in a complicated cylinder casting. These sleeves, which the Ferro company will carry in stock, may be replaced, if necessary, with little trouble or expense by the owner.

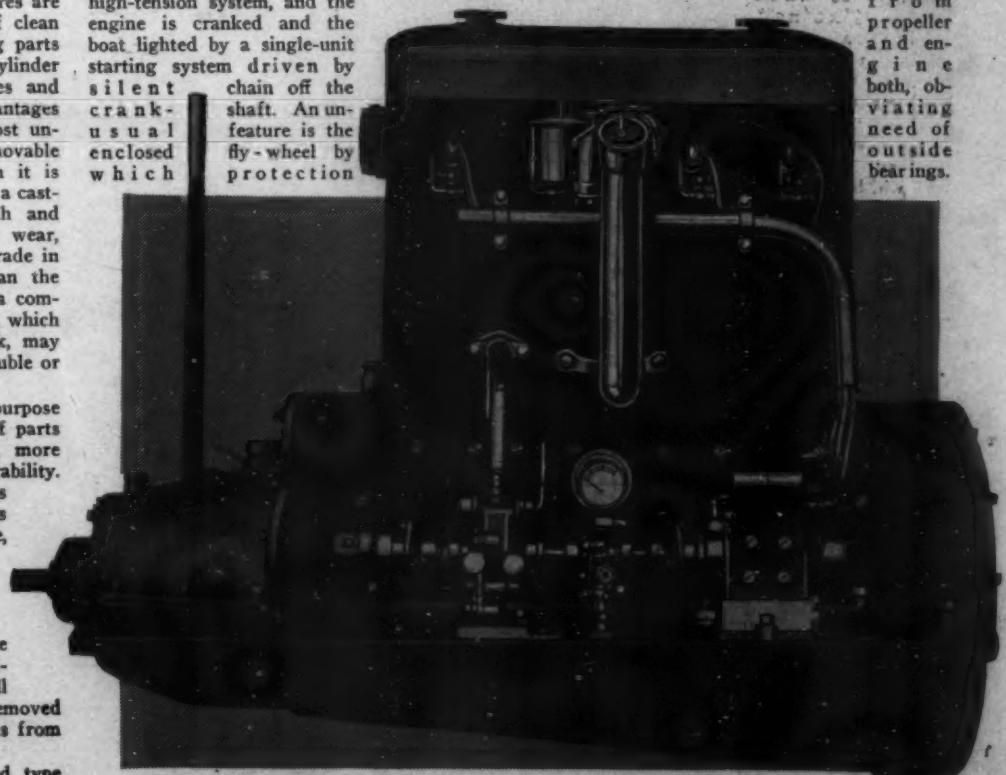
In using a block casting, it was the purpose of the makers to reduce the number of parts and make the engine more compact, more rigid, and of greater strength and durability. The detachable cylinder head, it is pointed out, makes the valves, pistons and cylinder bore easily accessible, while, because of this method, every bit of the combustion chambers with which the gases come in contact can be machined. A gain in power is claimed by having the valves in the head, and this construction also facilitates the inspection and grinding of all the valves. A cover, which may be removed with the bare hands, protects these parts from dirt and moisture.

The lubrication is of the force-feed type with oil passages cored in the casting. Oil is

supplied to every part of the engine by individual leads, and the oil is cooled in a water-cooled chamber. Ignition is by the Bosch dual high-tension system, and the engine is cranked and the boat lighted by a single-unit starting system driven by silent chain off the crankshaft. An unusual enclosed which

against injury is afforded the occupants of the boat. The integral reverse gear is fitted with double-row ball bearings, which take the thrust

from propeller and engine both, obviating need of outside bearings.



In the new Ferro motors the spark plugs are set in recesses in the cylinder casting.

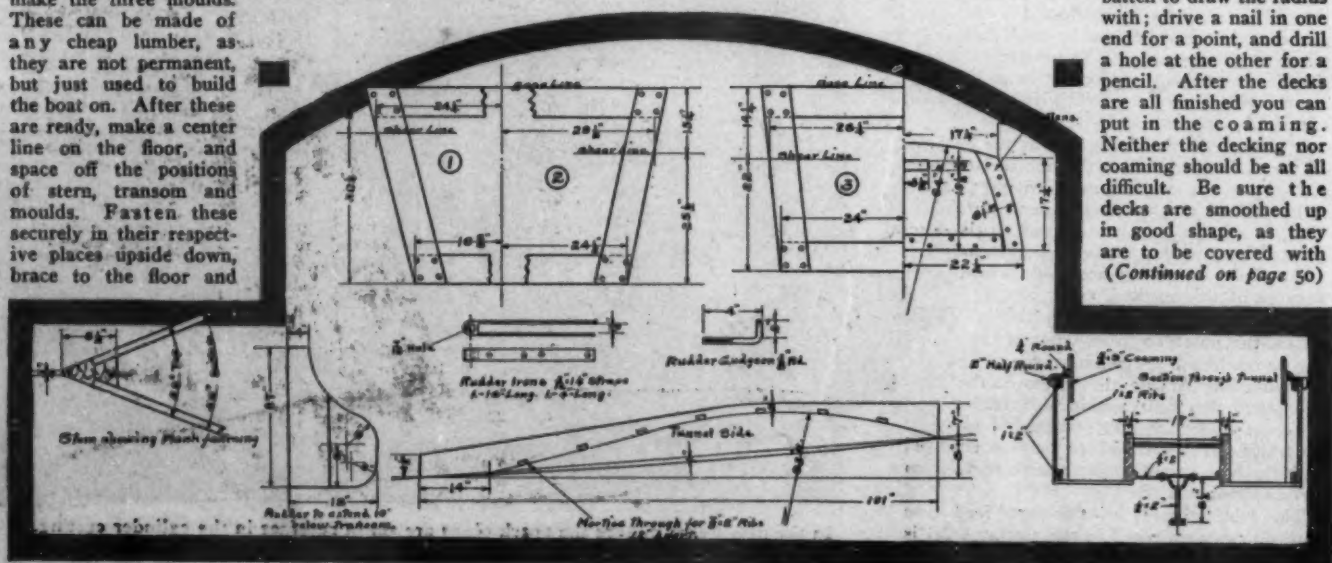
THE following boat has been used on the Mississippi River for the past two seasons and has been very satisfactory. She was designed especially for river use and draws only twelve inches of water. She is a flat-bottomed boat, but when she is in the water this is not noticeable, and, with her long front deck, is a very classy-looking craft. The cockpit is large and the lockers have ample room in them to stow everything necessary. The engine, being under the front deck, is out of the way, with no danger of engine trouble from rain or spray; there is also lots of room for engine supplies, making it possible to keep the cockpit and lockers clean. She is easy to build, even the tunnel, as shown, being very simple. Any one who can saw a board or drive a nail can build her. The front deck has no hatch, there being ample headroom for any suitable engine, and this feature does away with any chance of leaks.

each other with battens. Then fasten in the chine and gunwale battens; cut them at an angle at the stern and fasten just behind the rabbet. Cut a notch in the batten on the transom and set them in it. Be careful to keep everything straight so the boat will not be lop-sided, but nice and true on both sides. After these are in put in the ribs, space them 12" apart. When these are all in you can start planking. Space off into four equal parts, at stern, transom and each mould; this will give you the width of plank at these points, as there will be four planks on a side. We will put the plank next to the chine first, clamp it up to place as near as possible, and mark off the angle at stern; then run a pencil line along the chine batten, mark at stern, transom and at each mould the width of plank at each point; take it off and trim to the marks, clamp it in place, and if it does not fit perfectly mark and retrim. If the angle at rabbet is not a close fit trim it till it is a tight joint, as it will leak at this point if a good job is not done. Put on the other planks the same way; leave

the last or gunwale plank till boat is turned over, as it will be much easier to get to, then. Now, put on the bottom planks; they can be about 6" wide. Commence at the stern, make

in the top plank. Put spreaders across the boat below the deck line to keep her shape till deck is put in, then take out the moulds. The deck beams can now be cut and put in; use a batten to draw the radius with; drive a nail in one end for a point, and drill a hole at the other for a pencil. After the decks are all finished you can put in the coaming. Neither the decking nor coaming should be at all difficult. Be sure the decks are smoothed up in good shape, as they are to be covered with

(Continued on page 50)



From MOTOR BOATING Readers

MoToR BoatinG's columns are open to its readers, not only for asking questions, but for placing before other readers ideas, results of experience, opinions, etc., that should be interesting or helpful to them; but the editor will not, of course, be responsible for any opinions expressed or statements made in such communications. The name and address of the writer must necessarily be given in every case and return postage enclosed to make an answer by mail possible (no anonymous contributions will be considered for publication), but names will be omitted in publishing the letters and answers where desired. Through the correspondence department readers of the magazine may be of direct aid to one another in solving the problems of motor boating.

International Flag Signals.

To the Editor of MoToR BoatinG, Sir:
Will you kindly inform me what the international signal code flags are and how a signal is made and answered?

What are the signals of distress and also for a pilot?
G. K. F., New York City.

[The International Code of Signals consists of 26 flags—one for each letter of the alphabet—and a Code Pennant.

Urgent and important signals are two-flag signals.

General signals are three-flag signals.
Geographical, Alphabetical Spelling Tables, and Vessels' Numbers are four-flag signals.

INTERNATIONAL CODE SIGNALS OF DISTRESS.

(1) The International Code Signal of Distress indicated by NC;

(2) The distant signal, consisting of a square flag, having either above or below it a ball or anything resembling a ball;

(3) The distant signal, consisting of a cone, point upward, having either above it or below it a ball or anything resembling a ball.

For other signals of distress see article 31 of the International Rules to Prevent Collisions and article 31 of the Inland Rules to Prevent Collisions.

INTERNATIONAL SIGNALS FOR A PILOT.

(1) The International Code Pilot Signal indicated by PT;

(2) The International Code Flag S, with or without the Code Pennant over it;

(3) The distant signal, consisting of a cone point upward, having above it two balls or shapes resembling balls;

(4) The Jack, hoisted at the fore.

INSTRUCTIONS HOW TO SIGNAL.

In the following instructions the ship making the signal is called A; the ship signalled to is called B.

HOW TO MAKE A SIGNAL.

1. Ship A, wishing to make a signal, hoists her Ensign with the Code Flag under it.

2. If more than one vessel of signal station is in sight, and the signal is intended for a particular vessel or signal stations, ship A should indicate which vessel or signal station

she is addressing by making the distinguishing signal (i. e., the signal letters) of the vessel or station which she desires to communicate.

3. If the distinguishing signal is not known, ship A should make use of one of the signals DI to DQ.

4. When ship A has been answered by the vessel she is addressing (see paragraph 9), she proceeds with the signal which she desires to make, first hauling down her Code Flag as it is required for making the signal.

5. Signals should always be hoisted where they can best be seen, and not necessarily at the masthead.

6. Each hoist should be kept flying until ship B hoists her Answering Pennant "CLOSE UP" (see paragraph 10).

7. When ship A has finished signaling she hauls down her Ensign, and her Code Flag, if the latter has not already been hauled down (see paragraph 4).

8. When it is desired to make a signal it should be looked up in the General Vocabulary which is the index to the Signal Book.

HOW TO ANSWER A SIGNAL.

9. Ship B (the ship signalled to) on seeing the signal made by ship A, hoists her Answering Pennant at the "DIP."

(A flag is at the "DIP" when it is hoisted about two-thirds of the way up, that is, some little distance below where it should be when hoisted "CLOSE UP.")

The Answering Pennant should always be hoisted where it can best be seen.

10. When A's hoist has been taken in, looked up in the Signal Book, and is understood, B hoists her Answering Pennant "CLOSE UP" and keeps it there until A hauls her hoist down.

11. B then lowers her Answering Pennant to the "DIP," and

waits for the next hoist.

12. If the flags in A's hoist can not be made out, or if, when the flags are made out, the purport of the signal is not understood, B keeps her Answering Pennant at the "DIP" and hoists the signal OWL or WCX, or such other signal as may meet the case; and when A has repeated or rectified her signal, and B thoroughly understands it, B hoists her Answering Pennant "CLOSE UP."]

The Power Squadrons.

To the Editor of MoToR BoatinG, Sir:

Can you give us information as to where we can get in touch with some one having the new U. S. Power Squadron movement in hand? As chairman of the Los Angeles Motor Boat Club, I am anxious to get it started here.

F. Y. & L. Co., Los Angeles, Cal.

[The United States Power Squadrons is an organization of power boatmen in the country whose aim is to promote the question of the safe handling of power boats in the water of this country as well as to develop a high standard of skill in seamanship and simple navigation, as applied to small motor craft, and to educate their owners in all such questions. The squadron also plans to improve conditions between the merchant marine and the pleasure motor boat and to organize the latter so as to be of possible assistance to the United States government in time of need.

The United States Power Squadrons have the backing of both the Department of Navy



Very soon now the new boats which are building for the season of 1915 will begin to take this shape and we will all realize that it is the first sign of spring.

and the Department of Commerce and although the movement is still very young, yet its progress is being closely watched by the government authorities and it may be that should the movement be successful the entire supervision of the immense fleet of motor boats in this country will ultimately be turned over to the Power Squadrons.

Another of the objects of the Power Squadrons is that all its boats shall live up to the laws in regard to the equipment to be carried on their boats and never shall leave their moorings unless such equipment is on board. The government has already recognized the point and during the past season exempted the boats of one squadron from government inspection. This is only a beginning and if found practical will be extended to the other squadrons.

To join a squadron, it is necessary that the applicant satisfy the squadron officers as to his qualifications for being a member thereof and then to pass an examination given by the local board of examination. At the present time there are about ten boards of examination in the country, and these are assigned according to geographical districts, there being the following districts at the present time:—Coast of Maine and New Hampshire; Coast of Massachusetts and Rhode Island; Long Island Sound; Hudson River; New York Harbor and East River; Atlantic Coast south of Sandy Hook, including Delaware River and Chesapeake Bay; the Great Lakes and the Pacific Coast. It is probable that more boards will be established when necessary. Capt. N. L. Stebbins, 132 Boylston St., Boston, Mass., is in charge of all of the Boards of Examination and can furnish any information desired.

The examination which every person must pass is a very practical one and has reference to the laws and rules for handling power boats, especially small boats, and other questions closely allied thereto. Questions on the following subjects are embodied in the examination: Rules of the road, rights of way, whistle signals, fog signals, special lights, lights for steam vessels and motor boats, lights for tows, the compass, and its use, buoys and other aids to navigation, the chart and its use, equipment for motor boats, use of log and lead line, sounding, proper colors to fly, etc.

In addition to the examination, which is oral, the candidate must prove that he has had experience in the actual handling of motor boats and that he is really qualified to do so.

Upon passing his examination he is given a certificate stating he has passed same and is allowed to fly the distinguishing flag of the squadron, as long as he lives up to the requirements of the squadron.

Passing the examination does not mean that the holder of a certificate is by any means an expert navigator or seaman, and much is required of the member after he has been admitted until he has had the required amount of experience.

At least six squadron drills are held by each squadron during the year and every member is required to attend at least three of the drills of his squadron per year until he has attended a total of twelve drills, whereupon attendance at drills becomes optional. A member who does not attend at least three drills per year unless excused by his Commander, is dropped from the squadron.

The drills are of a character to allow the officers of the squadron to find out whether their members are competent to operate their boats or not and also to train the members in various evolutions, and give them experience in handling their boats by means of code signals.

If you wish to form a local squadron, you should select a yacht club of which you are a member, and from the members of said club or group of clubs your local squadron can be formed. The club or clubs of themselves need not act officially in the matter unless they so

wish. The members of the local squadron must be members of the club or clubs in which the squadron is formed. A minimum of ten boat owners is required.

When the minimum number have decided to form a squadron, they should choose temporary officers, and the squadron should then apply to the district Board of Instruction and Examination for the examination of its members. When ten of said members (boat owners) have passed the examination, the squadron then applies to the Governing Board (through to Chief Commander) for admission to membership in the United States Power Squadrons.]

Suggestions as to the Racing Rules of 1915.

To the Editor of Motor Boating, Sir:

I have never served on a Racing Committee or on a Rules Committee, and therefore feel that I am a little rash perhaps, in communicating with you with regard to suggestions as to the new rules for 1915. Concerning a matter so complex and difficult probably a large number of amateurs have an equal number and variety of opinions all without any very definite basis in a mathematical conception of the problem or in extended personal experience. Perhaps all amateurs, however, who desire motor boat racing to be a contest among gentlemen on the one basis of fair play and honest rivalry as distinguished from a contest among sharpers and tricksters on the one basis of double dealing and mean advantage, will agree that the more nearly the rules reach the ideal of a boat-for-boat test the better will be the spirit of the sport.

It is obvious that the rules must reduce the hulls and the engines as nearly as possible to a uniform ground of comparison so that in motor boat racing as in sail boat racing inequalities will be leveled and undue advantage corrected. A word now as to the measurement of hulls. The system, which for so many years has obtained by which the midship section is taken as the base of computing the size of the underbody of the boat which is driven through the water, from the outset appealed to me as unfair. It has resulted, broadly speaking, in the following situations as exemplified by these data. Certain designers have acknowledged to me that between two seasons they had taken one of their boats, changed the planking opposite the midship section so as to add considerably to her beam and thus so as to lower her already advantageous rating and likewise so as to secure a walk-over for this boat in a certain race. Take another example, you are probably more aware than I of several well known boats of rather old design with full forward body and rather narrow midship section and again full afterbody. This model of hull slows the speed of the boat in any event and the defect in the rule of taking the cross section amidships, sends the rating of these boats up so as to really penalize them. Thus through a defect in the shape of the body at the midship section this boat is irregularly and unfairly handicapped although the rule is fulfilled. Take a third example, which is presented by the modern V-bottom cruiser of which we have this year seen a remarkable, and conspicuous example. The underbody of these boats is very narrow forward and almost flat aft of the midship section, which latter in its own term, may be made wide to an exaggerated degree—a fact which sacrifices the beauty of the hull but fully accomplishes its object in beating the rules so that they are of no value in comparing such a boat with normally built older models.

It is obvious that the new rules of 1915 should be so drawn as to make such evasion practically impossible in the measurements of the hull and I would, therefore, ask your opinion as an expert measurer of boats and mathematician, concerning the following plan. Let every hull be measured as to the underbody at three points, namely at 25%, 50% and 75% of the length proceeding aft from the stem. Having secured these three cross sections, let them be averaged and let the average be taken in applying the rule.

Let us see how such a rule would tend to level the differences between the hulls of the three types just spoken of. First, it would be difficult to change the planking of any boat through the winter so as to alter its rating over against the coming season. Second, an old model of hull with faulty lines forward, aft and amidships would be given the mean of these faults in her measurements and perhaps, thereby, be brought to a truly equitable rating. Third, the V-bottom cruiser and her allies which approach the hydroplane type would be properly handled with severity in that her narrow forward and aft section would raise her rating enormously and possibly to a point where it ethically belongs, in that her V section forward and flat section aft would be respectively little and next to nothing so that her artificially wide midship section would be divided practically by three. The result is obvious and along the lines of making

this model of boat less attractive to the "cup grabber" and less successful in "cup grabbing" and less discouraging to the honest boatman who finds pleasure only in a gentleman's sport in which honor and fair play, skill and courage are the prevailing impulses.

Now a word as to the definition of cruiser before I take up the subject of engines. I think the word cruiser is well defined in the rules of 1914, except for one fact there is no requirement in the definition for proof of the fact that the owner and his crew use the boat for sleeping purposes.

A case in point is illustrated by my experience in one of the long distance races against some of the notorious racers of the year. The boats anchored for the night at the half-way point and two "cruisers" were the only ones in which the owners and their crews did not sleep for the night and on which they did not have their meals when not under way. Instead of "cruising" in this way, the owners and crews of almost all the other boats had their meals on them and without exception they all slept on them including the women of the families in one or two cases. In this sense they were true cruisers and used as such by their owners, in definite contrast with the others whose owners and crews went to the hotels of the town for the meals and the night but employed the boats only for the racing, to which anyone would have conceded the first prize in order to eliminate the feeling of being in a race in which unfair advantage was sought and accepted by any contestant.

I, therefore, repeat that the new rules should require more than the mere physical form and equipment of the hull, in that they should demand proof of use of the boat as a cruiser in the broad and not the mere technical sense. I trust that I have made this perfectly clear to you.

Now a word as to the engine. I have been told that the new rules will regard not only the cubical capacity and displacement of the cylinders, but also the number of revolutions per minute. This is as it should be, provided the element of cheating may be eliminated this year as it was not eliminated a few years ago when a similar provision was present in the rules. A salutary element is that of the disqualification of the cheater for the rest of the season which ought to be a good check provided the establishment of this conduct may be had. Might it not be well to require in all the racing rules that every application shall be accompanied by a catalog, circular or blue print of the manufacturer of the engine showing the horsepower curve, and stating the revolutions expected for the commercial rating of the engine at which it is sold. By this I mean, for example, that the engine of my boat is sold to develop her horsepower at 600 revolutions per minute. With this as a primary basis and with the owner's statement of the revolutions he obtains with a particular wheel, and with the average size of the underbody known by the measurements and with the speed of the boat during the race observed and recorded, it may be possible to detect the cheater, disqualify him for the given race and penalize him for the season by disqualification in all future races.

The importance of equalizing the horsepower of engines under the new rules by correction of the shortcomings in the old rules is illustrated by the experience in most of the long distance races in this part of the country in 1914. The engine of a certain well-known racing cruiser which swept the "river, harbor and bay" clean of first prizes, was rated under the 1914 rules as about 50 h.p. through total disregard of the revolutions per minute. As a matter of fact, this particular type of engine at the admitted shaft speed developed from 100 to 120 h.p. and inasmuch as during at least several of the races one or more professional engine men were on this boat, the clean-handed amateur will realize how little chance any other boats had against this one whose owner prided himself in beating every boat in the races, independent of classification. Small wonder, the only way in which he could be beaten was to have his boat burn or sink or engine break an integral irreplaceable part.

There should also be a rule relating to a reasonable proportion between the size of the hull and the horsepower for cruisers. In other words, a so-called cruiser with an engine developing from 100 to 120 h.p. is far "over engine" as to be an anomaly to this class and to contradict the very term of cruiser. Such a boat is not a cruiser but a racing boat to which a certain technical cruising equipment has been added. It seems to me that it would be possible to rule that cruisers cannot be so classed if their engines exceed 1 h.p. or 1.5 h.p. per foot of length. I personally prefer the former limit, 1 h.p. per foot of length, inasmuch as first class designers have told me that an engine which delivers fully 40 h.p. in a 40 ft. boat overpowers the boat for cruising purposes. If, however, the former limit 1.5 h.p. per foot of length were taken it would make it possible for an engine developing 60 h.p. to be put into a 40 ft. cruiser, and thereby again reach the racing boat type veneered with the theory of cruiser, but as far from the fact of cruiser as anything can be.

In this way we should finally work out much the same proportion between the horsepower and the hull as has been worked out for sail boats. If one looks up the classification of sail boats he is at once struck with the fact that in motor boating we have by comparison very meagre classification. In other words, if we follow the lead of sail boat practice and improve our classes we will probably improve the racing.

With the deep enthusiasm in this kind of sport that I have always tried to show, I am, for fair play and just rivalry,

VICTOR C. PEDERSEN, N. Y.



Photographs by N. L. Stebbins.

Even in sail boat racing, motor boats are often called upon to perform official service.



Float of N. Y. Athletic Club at Travers Island on Block Island Race Day.

Kathryn S. Thistle, Spare Time and Curlew tied to the float.

Motor Boat Club of America Reorganized.

At the recent annual meeting of the Motor Boat Club of America, J. S. Blackton, of New York City, was elected commodore, James Elverson, Jr., of Philadelphia, vice-commodore, and W. H. Thompson, of Chicago, rear-commodore. At a recent dinner given by Commodore Blackton, he announced the plans of reorganizing the club and putting it upon a basis which will assure the country of systematic and well-managed motor boat racing for the coming season, not only among the fastest hydroplanes of the world, but a development of the restricted and one-design classes, in which to date this country has been sadly lacking.

Tentative plans have already been announced for the forming of a syndicate to send a boat abroad to compete for the Harmsworth Trophy as soon as foreign conditions become settled. This syndicate will be headed by Commodore Blackton, who has the engine already built for the boat and is now actively engaged in experimenting with different types of hulls to use with the particular motor.

The Motor Boat Club of America is holder of the Gold Challenge Cup, which was won by Mrs. Blackton's Baby Speed Demon II on Lake George during the past season. Plans are practically completed for holding the 1915 races for this trophy in the vicinity of New York City, probably on Manhasset Bay, which will give New Yorkers their first opportunity to see real hydroplanes in racing competition. Manhasset Bay is an ideal location for races of this kind, both in regard to the race course itself and means of transportation of both spectators and boats. The course is practically land-locked, yet there is a depth of water of not less than 20 feet over its entire course and it is entirely free from drift wood. Three first-class yacht clubs are located on Manhasset Bay with facilities for taking care of an almost infinite number of yachtsmen.

Strenuous Year Ahead for the Chicago Motor Boat Club.

At the recent annual meeting of the Chicago Motor Boat Club, held at their clubhouse in Chicago, the following officers were elected: Ralph Esau, Commodore; W. C. Anderson, Vice-Commodore; G. A. Weiderman, Rear Commodore; Will Gray, Secretary; Geo. H. Baker, Treasurer. The above officers have pledged themselves to a strenuous year, and according to all accounts, the season of 1915 will be the most prosperous one in the history of this young club. Among the many activities which the Chicago Motor Boat Club is interested in is the new United States Power Squadrons, and arrangements have been completed for the formation of an examining board to cover the district in the vicinity of Lake Michigan, and it is probable that before winter is over a large squadron will be formed in this vicinity.

Miami Regatta Plans.

As chairman of the regatta committee, Mr. Carl G. Fisher, of Indianapolis, has arranged a series of scratch races for all classes of boats, with prizes aggregating in excess of \$2,500.

The prizes in all classes become the absolute property of the winners. There are no entry fees, no handicap rules and no conditions designed to permit any but the fastest boats to win in their respective classes. The judges are all editors of leading magazines, with national reputations.

Those interested are urged to write immediately to the regatta committee for any special information desired. Assistance will be gladly rendered regarding transportation, reservations, etc.

Friday, Jan. 15.

10:00 a. m. Captains of all power boats report promptly at Regatta Committee headquarters for entry and inspection.

12:00 noon. Luncheon to visiting yachtsmen, Royal Palm Hotel, auspices Miami Board of Trade.

1:30 p. m. Open displacement power boats over 25 feet. Distance, three times around, 15 miles. No handicap.

2:45 p. m. Cabin cruisers over 30 feet. Distance, three times around, 15 miles. No handicap.

4:00 p. m. Hydroplanes, any length. Distance, six times around, 30 miles. No handicap.

7:00 p. m. Dinner-dance and smoker, Royal Palm Hotel.

Saturday, Jan. 16.
10:00 a. m. Open displacement power boats, 25 feet and under. Distance, twice around, 10 miles. No handicap.
10:45 a. m. Cabin cruisers, 40 feet and under. Distance, twice around, 10 miles. No handicap.
1:30 p. m. Open displacement power boats, any length. Distance, three times around, 15 miles. No handicap.
2:30 p. m. Cabin cruisers, any length. Distance, three times around, 15 miles. No handicap.
4:00 p. m. Hydroplanes, any length. Distance, seven times around, 35 miles. No handicap.
9:00 p. m. Distribution of prizes and Yachtsmen's Ball, Royal Palm Hotel.

Annual Dinner of the Colonial Yacht Club.

One of the big events of the winter yachting season of New York City was held on December 5th at the Aldine Club, it being the annual dinner of the Colonial Yacht Club of New York City. The many trophies presented during the year by members



Trophy presented by Jos. H. Wallace of the N. Y. Athletic Club, for the Viking Races of 1914. Won by Fabuis owned by W. E. Thomas.

of this club were awarded to the winners during the evening. Among these should be noted the following trophies: Commodore Baker Trophy, Vice-Commodore Robinson Trophy, Rear-Commodore Mahnken Trophy, the Bendix Cup, the Betts Trophy, the J. A. Donegan Cup, the Geng Trophy, the Metz Trophy, the Reinachild Cup, Hunt Trophies for Cornfield Light House, Ladies' Race, Entertainment Race, the Knowles Cup, the McMeeken Cup, the Meert Cup, the Philippeau Trophy, the Van Blerck Cups, and the Welch Trophy.

Ex-Commodore James A. Donegan acted as toastmaster, the principal speakers being N. J. Baker, of the Colonial Yacht Club, and Commander Franklin P. Pratt of the Hudson River Power Squadron. The success of the dinner was in a large measure due to the efforts of the dinner committee, and especially Mr. Charles Franklin.

Chelsea Boat Club's Annual Ball.

The principal yachting event of the winter, as well as one of the leading society functions at Norwich, Conn., was the first annual ball of the Chelsea Boat Club, held on Thanksgiving evening at the state armory. The success of the event was chiefly due to the efforts of Commodore Julian L. Williams, with the assistance of the Club's Secretary Frank W. Holms and Treasurer W. M. Buckingham. While this was the first ball ever attempted by this club, yet they have a long-standing reputation as yachtsmen, the club being founded in 1877. To-day it occupies a position of importance among the motor boat men at the western end of Long Island Sound, and among its fleet are found a number of the best craft that navigate those waters.

S. J. Y. R. C. Plans for 1915.

The South Jersey Yacht Racing Association, which embraces a majority of the best yacht and motor boat clubs on the South Jersey shore, recently held its annual meeting and election of officers at the Adelphi Hotel, Philadelphia, Pa. The former president, Commodore A. K. White, of Atlantic City, refused re-election and Commodore Charles J. Curran of the Ocean City Yacht Club, was elected president for the coming year.

Commodore S. W. Whan, of the Chelsea Yacht Club, was chosen Vice-President, and Joseph L. Bailey, of the Holly Beach Yacht Club, was re-elected Secretary and Treasurer.

The following schedule of racing events was drawn up for next season: July 10th, Ocean City Motor Boat Club; July 17th, Cape May Yacht Club; July 24th, Atlantic City Yacht Club; July 31st, Corinthian Yacht Club of Cape May; Aug. 7th, Sea Isle City Yacht Club; Aug. 14th, Chelsea Yacht Club; Aug. 21st, Stone Harbor Yacht Club; Aug. 28th, Avalon Yacht Club; Sept. 4th, Ocean City Yacht Club.

Changes in the United States Power Squadrons' By-Laws.

At a recent meeting of the United States Power Squadrons held at the New York Yacht Club, New York City, several important changes were made to the by-laws. Among these the most important ones were—the provision for three kinds of members in local squadrons, to be known as members, senior members and privilege members. A man becomes a member upon receiving his certificate indicating that he has passed the examination of the district board of examination and instruction and has been enrolled in the local squadron. He becomes a senior member and he receives a certificate of such membership when he has participated in six drill periods. He becomes a privilege member and receives a certificate of same when he has participated in 12 drill periods.

For qualification as a senior or privilege member, a man must participate in not less than three drill periods each year and not more than six drill periods in any one year to count towards such qualifications.

Delaware River Plans.

The Delaware River Yacht Racing Association, the largest and strongest of the local sections affiliated with the American Power Boat Association, will be led during the coming year by Commodore Cartledge, of the Keystone Yacht Club, succeeding Commodore E. C. Haddy, of the Camden Motor Boat Club, who has refused re-election.

One of the important actions taken at the recent meeting of the association was the appointment of a committee for arranging a motor boat show in Philadelphia to be held during the coming winter. A committee was appointed consisting of Commodore Cartledge as Chairman, with Commodores Haddy, Cruse, Johnson, Dr. Eugene Swayne, S. S. Delamater and H. A. Remper to arrange the many details of staging the show.

Plans for next season's racing events were discussed, and while no definite conclusions were reached, it appears most likely that a schedule similar to that of 1914 will be arranged, so that each club will be given a date for an open race.

New Things For MOTOR Boatmen

Schwarze Electric Horn.

The Schwarze Electric Co., of Adrian, Mich., manufacture a marine electric horn which embodies the non-arcing feature, designed to ensure long life and perfect service. Its "voice" is a high piercing sound which penetrates and carries a long distance. The Schwarze is intended for use with five dry cells or a six-volt storage battery, or it can be wound for higher voltages if desired. The horn has a 3 1/2-inch diaphragm and measures 10 inches high by 4 inches at the base. It is sold for \$3.50.

A Gemco Searchlight.

The Garage Equipment Mfg. Co., of Milwaukee, Wis., put out a searchlight for motor boats which is used in conjunction with a substantial bracket which is bolted securely to the deck. This bracket has a double swivel feature which enables it to be turned up, down or sideways. The searchlight is of the electrobola type made from one solid casting of aluminum, and with the reflecting surface highly polished, and accurately ground to throw a far-reaching light. The 10-inch lamp shown in the illustration complete with bracket is sold for \$13.

Hampton Kerosene Carbureter.

The Hampton Kerosene Carbureter Co., of 1876 Broadway, N. Y. C., will have a new multiple jet carbureter on exhibit at the New York Show, which they state is an extremely powerful instrument, possessing, moreover, the advantage of being equally available for gasoline or kerosene. The three models of the latest type Hampton kerosene carbureter are said to mark a distinct advance in carburetion, not only a saving in the cost of fuel, but an economy of the fuel itself being effected. These carbureters are constructed with a dual fuel chamber for accommodating gasoline for starting purposes, and kerosene. One fuel or the other is admitted to the mixing chamber, which is surrounded by a jacket through which a portion of the exhaust gases flow, by merely turning a lever.

Crescent Adjustable Wrench.

An adjustable wrench with drop-forged, hardened steel handle is made in seven sizes by the Crescent Tool Co., of Jamestown, N. Y. The movable jaw has a large bearing surface in the handle and when in use tends to lock itself on the handle, thereby relieving the strain on the thumbcrew. The thumb-screw can be turned by the thumb and the opening easily adjusted. A hole is provided in the handle for hanging the tool on the engineer's board. The 4-inch size, polished, is sold for 65 cents.

Eisemann G-4 Magneto.

In the Model G-4 four-cylinder magneto the Eisemann Magneto Co., 32 Bush Terminal, Brooklyn, N. Y., have aimed to combine all the advantages of simplicity, reliability and efficiency. At the same time, this magneto, which marks this firm's entrance into the marine field, has been designed to be dust and waterproof, and yet thoroughly accessible. The platinum contacts can be easily regulated without removing the timing lever, the collector ring can be examined and cleaned, if necessary, and likewise the distributor disc, by simply sliding a spring to one side and removing the distributor plate. Another feature lies in the arrangement of the high tension, as well as the primary connections, these being placed inside the magneto to prevent danger of short-circuit. This instrument is declared to deliver an excellent spark at the lowest speeds which carburetion will permit, rendering starting on the magneto easy.

Universal Rear Starter.

The Universal rear starter is designed for installation with any type of motor to make starting easy. It is fitted with a safety crank having three rolls vertical to the shaft which move up an incline when the crank is turned, causing an expansion be-



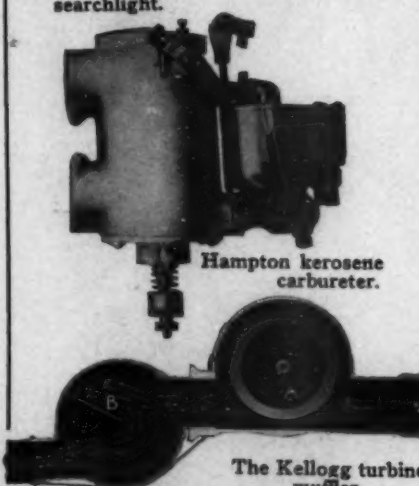
The Schwarze marine electric horn.

Safety crank mechanism of the Universal rear starter.



Gemco double swivel searchlight.

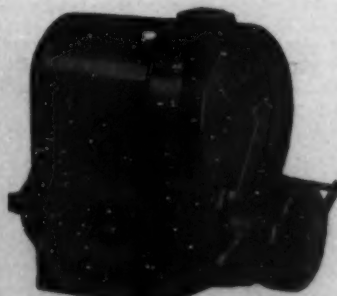
The Wilco outboard motor.



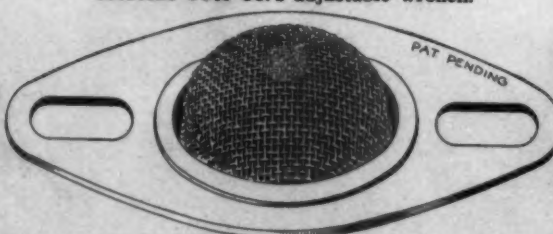
Hampton kerosene carbureter.

The Kelloogg turbine muffler.

Crescent Tool Co.'s adjustable wrench.



Eisemann Type G-4 magneto.



The S-P vaporizer.



Quadruplex gearing of Joe's gear.

tween the lever and the cam ring. The cam ring, as auxiliary, engages the shaft and lever by means of a friction cone, thus transmitting the cranking force to the motor. In the event of a back kick the three rolls release the lever and cam ring, annulling the pressure between the lever and cone, thus releasing the indirect connection between the handle and the shaft, and eliminating danger of injury. The Universal Safety Starter Co., of 311 Atlantic Ave., Boston, Mass., are the makers.

The Wilco Outboard Motor.

The E. J. Willis Co., of 83 Chambers St., New York City, is putting out a new outboard motor which is known as the Wilco. Only the highest grade of materials are used in its construction, and the design is of such sturdy simplicity that the makers stand ready to back it for efficiency and durability. Two horsepower is developed at 800 r. p. m., the motor turning a 3/4-inch manganese wheel of special type. The crankshaft in this motor is made of the best carbon steel, and the connecting rod and crankcase are of phosphor bronze. The crankcase is cast integral. Especial attention has been paid the flywheel in the designing and machining to make it run without vibration. The Wilco is offered with or without reversible magneto at attractive prices.

The Kelloogg Muffler.

The Kelloogg Mfg. Co., of 106 Circle St., Rochester, N. Y., are just bringing out an exhaust muffler which is claimed not only to destroy the explosive noise of the motor but to materially help the discharge of the exhaust gases by relieving back pressure. The construction of this silencer includes a simple turbine wheel which is mounted in the path of the exhaust. Just forward of this wheel is an opening or by-pass which leads to the center of the turbine. The rapid turning of the turbine caused by the exhaust of the motor is stated to create a powerful suction that relieves the motor of all back pressure, as well as heat and carbon-producing elements. A baffle plate further muffles the reports.

The S-P Vaporizer.

The S-P vaporizer has been designed primarily to accomplish two things—to effect an economy in fuel consumption and to prevent the motor from back-firing in the carbureter. In addition to this it is claimed to prevent the motor from choking up, and thus obviate the necessity for scraping out carbon. The vaporizer is installed between the carbureter and the intake pipe, serving as a gasket between these two members. Theoretically there is but one piece to this device, but actually there are four parts put together in such a manner as to make one inseparable piece—a lead gasket, two layers of copper gauze, and an absorbent asbestos composition ball between them. The purpose of the gauze is to prevent flame from reaching back into the carbureter, and the ball is designed to break up the gasoline particles more thoroughly than is done by the carbureter and thus improve the quality of the mixture. The cost of this device, which is made by the S-P Vaporizer Co., Inc., of 125 E. 23rd St., N. Y. City, is \$3.

Joe's Reverse Gears.

The Snow & Petrelli Co., of New Haven, Conn., will make their Joe's reverse gears this year on practically the same lines as heretofore, with improvements here and there and an increase in the number of sizes available. One of their types, Joe's Duplex Friction Drive reverse gear is designed expressly for heavy duty motors where strength and efficiency are absolute necessities. These gears contain two distinct friction clutches, located at either end of the gear and so arranged as to take the strain off the gearing on the go-ahead drive. By reference to the illustration it will be seen that the arrangement of the quadruplex gearing is compact and well balanced. The gears are all made of steel with the exception of the large internal rack. An important feature of this type of gear is the ratio of the reverse drive, which is practically 1 to 1.



The Roller-Smith ammeter.



X-Ray spark plug detector.



Phinney-Walker keyless clock.

The Roller-Smith
C. O. D. indicator.

The Roller-Smith Ammeters and Indicators.

The Roller-Smith Company, of 203 Broadway, New York City, are making "Auto-imp" ammeters in flush type with either black or white dials, and in flange and standard types also. These instruments are especially designed for use with lighting systems. The mechanism is protected by a moisture-proof case, and is designed to withstand the effects of vibration and shock under extreme conditions of service. The indicators, known as the "C. O. D." indicate plainly whether the battery is "charging," "off," or "discharging," and if the lighting and starting system is performing its functions perfectly or not. The mechanism of this device is very simple, there being but one moving part.

"X-Ray" Spark Plug Detector

The X-Ray Spark Plug Detector Co., of Pleasant Lake, Ind., have introduced a device which is designed to show at a glance any individual plug which may be misfiring. The detector is made of black rubber composition and is located in the operator's line of vision. Each plug is numbered on the dial. The cost is \$5 for four- and \$6 for six-cylinder motors.

Compressor-Motor Engine Starter.

The Auto Air Appliance Company, of Baltimore, Md., has recently brought out an air compressor-motor engine starter, which, in performance, is somewhat similar to an electric starter in that it generates its own power and uses its stored-up energy as a motive force for spinning the internal combustion engine. The machine is a small four-cylinder compressor-motor combined in a single unit. It is connected to the engine crankshaft by means of a Coventry silent chain and operates at approximately half engine speed when charging the tank, while it drives the engine at one-fifth the air motor speed when acting as a starter. Complete with automatic governor, storage tank, air gauge and two valves, it weighs approximately 85 pounds. With an 8x4-inch tank and air at 235 pounds pressure it is stated to turn over a medium-size engine at 200 r. p. m. and start it 35 times.

The Vlček Valve Lifter.

The Vlček Tool Co., 10709 Quincy Ave., Cleveland, O., in addition to their supply of tools have added to their line a new drop-forged valve lifter. The sharp points of the tool can be easily inserted between the springs, the machine-cut thread and the sliding movement of the cam making operation an easy matter. A bar can be passed through the handle for greater leverage wherever desired.

The Presto Lamp.

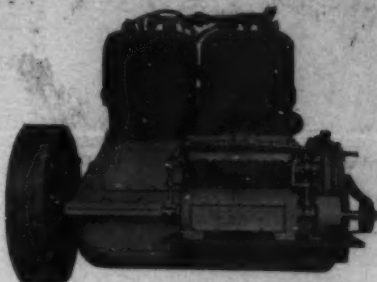
The Metal Specialties Mfg. Co., of 736 W. Monroe St., Chicago, Ill., have just introduced the Presto hand lamp, which is equipped with a tungsten bulb and a two-inch bull's-eye lens and can be attached to any ordinary dry cell ignition battery. The attaching device is so arranged that it may be connected to the center electrode of either the flush cap or the extended cap type of cell, and the other connection is a flexible one to a terminal at the back of the lamp. A switch is provided for turning the light on or off. Complete with battery the lamp is sold for \$1.25 or for \$1 without battery.

The Model K Stromberg.

The Motor Devices Co., of Chicago, Ill., have added Model K, made in three sizes, to their line of carbureters. It is designed primarily with a view to combining fuel economy with maintenance of power or acceleration by means of a new type of balanced air valve and venturi tube combined with the introduction of warm air to both fixed and auxiliary supplies with the result that complete vaporization of the fuel is assured. There is a new and simplified float mechanism which necessitates only one adjustment (marked A in the illustration). The prices range from \$15.50 for the 1-inch size to \$20 for the 1½-inch.

"Gas, Gasoline and Oil Engines."

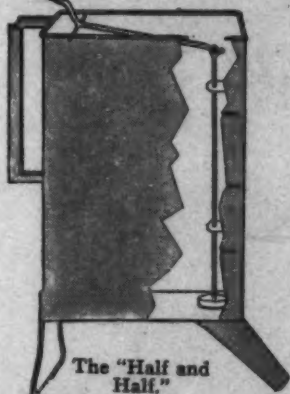
The Norman W. Henley Publishing Co., of New York, have recently brought out the 1915 edition of "Gas, Gasoline and Oil Engines," by Gardner D. Hiscock and Victor W. Page. It is intended for any one interested in the subject, whether he be a scientific expert, student, or plain engine bug. This



Auto Air Appliance Co.'s compressor-motor engine starter.



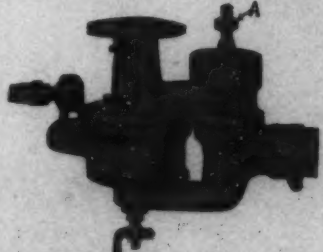
Vlček's valve lifter.



The "Half and Half."



Presto hand lamp.



The Northwestern detachable row-boat motor

Stromberg Model K, which is made in three sizes.

edition is enlarged and revised, considering exhaustively all types of internal combustion engine for marine, stationary, motor vehicle and aerial use, both as to construction and management. Chapter 16, dealing specifically with the marine engine, and illustrating several motors, which, however, are not always the latest of their respective lines, and Chapter 17, dealing with the oil engine and the Diesel, will be of most interest to marine people. The book sells for \$2.50.

Keyless Clocks.

The Phinney-Walker Co., of 246 W. 59th St., New York City, manufacture a line of keyless clocks which wind and set by the rim exactly as a watch is wound and set by the stem. There is no key to lose, and the clocks are built to withstand vibration and keep reliable time. The clock shown in the accompanying illustration is especially designed for motor boat use, having a steering wheel dial. Model Q with a 2½-inch dial is sold for \$10, and Model C with a Seth Thomas, 7-jeweled movement, for \$35.

The "Half and Half."

The No-Shammy Products Co., of Cleveland, O., makers of the No-Shammy funnel, are producing the "Half and Half," a simple device designed to measure and pour lubricating oil into the various oil compartments of a power plant. It is made of sheet metal, heavily copper-plated, and it is rectangular in shape. From one corner of the bottom projects a spout which permits careful and accurate pouring, the flow being controlled by a little valve at the inside end of the spout which is operated by a thumb-pressure lever. The sides of the "Half and Half" are graduated to indicate the amount of oil contained in the measure. It is made in two sizes, a quart size selling for \$1, and the two-quart size for \$1.50.

Northwestern Outboard Motor.

The Northwestern Motor Co., of Eau Claire, Wis., have recently brought out the Northwestern detachable rowboat motor which, with bore and stroke of 2½ inches, is designed to develop 2 h.p. at 800 r.p.m. The castings of this motor are made of the highest grade of semi-steel and malleable iron. All parts below the water are bronze with the exception of the cut gears which revolve in oil. The exhaust pipe is of aluminum, and the flywheel is nickel-plated. A convenient steering handle with notched ratchet permits of the boat being set to go straight ahead or at any angle. Ignition is by battery or Bosch magneto. The cost is \$50.

Boat Building for the Amateur.

For the benefit of those who prefer to build from plans, etc., the American Launch Co., of Bayonne, N. J., are putting up an outfit which consists of blueprints, building directions, specifications, lists of lumber, fastenings and fittings, patterns, and photographs. The building directions consist of a correctly worded, non-technical set of directions which tell the amateur the easiest way to do certain parts of the work, point out pitfalls, etc. Then there is an itemized list of every piece of wood that goes into the boat, and a list showing the number of square feet of the lumber necessary to buy. The alphabetically arranged list of fastenings gives the place where each fastening is used, and is a great time saver. Complete full size patterns on heavy brown paper of every frame, stem, transom, transom knee, all planking, covering board and coaming are furnished. Perhaps the most useful feature of the outfit is the set of photographs showing the boat in various stages of construction.

The Improved Schoop Spraying Pistol.

The Metals Coating Co. of America, of 122 So. Michigan Ave., of Chicago, Ill., have recently introduced into this country and are now offering for sale with certain improvements, the Schoop metal spraying pistol which may be used for covering articles with lead, tin, zinc, copper, bronze, etc., with a coating from .001 in. upward in thickness. This device is so constructed that the metal to be sprayed is fed into the pistol in wire form and remains in the solid state until a train of gears carries it to within ¼-inch of the nozzle when a hot oxy-hydrogen blast strikes it, converts it to a molten state and causes it to be entrained with a jet of air and sprayed out in an even stream. Although issuing from the nozzle at temperatures varying from 700 to 2000 degrees, according to the wire used, metals can be applied with this pistol on such materials as paper, wood, or silk without injury to the fabric.



YARD AND SHOP

View in the engine testing room at the plant of the Sterling Engine Co., of Buffalo, N. Y.

Show Features.

The United States Government is to have quite a large exhibit at the annual Motor Boat Show. The Coast and Geodetic Survey bureau will show the new charts which have been prepared specially for motor boat men and these will show the inland waterways of this country and thus enable an owner to plot out a thousand and one cruises he may make in his boat, no matter how small it is. The growing interest in motor boating has caused the government to take this interest in the sport, and the new charts which will be shown by competent representatives of the bureau will attract much attention. They will be fully explained and other information will be ready for those who wish to learn, and there are always hundreds who are anxious to increase their knowledge.

In addition to these charts the educational features of the show will be more attractive this year than ever. Many men prominent in nautical things will deliver lectures which are to be well illustrated, some with lantern slides. These lectures were well attended last year and the talks included the compass, chart reading, the marine engine and all sorts of other topics of interest to the yachtsman. In addition there will be an information bureau at which experts will answer all sorts of questions that visitors may put to them. They will give advice about boats and engines and assist those who are wanting boats to get the proper type of craft suited to the waters where they are to be used.

The show will open in the Madison Square Garden on Saturday, January 31st, and will remain open until the following Saturday night.

Sterling Catalogue.

The Sterling Engine Co., of Buffalo, New York, is publishing a handsome catalogue, covering its 1915 line of motors for marine service. The book is attractively bound in buff board and contains more than fifty pages. All types of Sterling engines are exhaustively described and illustrated. There are also numerous tables giving in brief specifications of the various models with other information and prices.

New Anderson Dealers.

The Anderson Engine Co., of Chicago, announces the appointment of the following new distributors: Doherty Hardware Co., of Baton Rouge, La., and F. L. Trepagnier of Donaldsonville, La.

New Supply Station.

The Great Western Oil Co. has opened a station at Traverse City on the Grand Traverse Bay, where motor boats may obtain supplies of gasoline and oil. The station is located on Front St., Traverse City, and extends back to the dock line, and the company calls attention to the fact that it will handle all high grade motor oils and gasoline.

John Joins Smith Staff.

Charles S. Smith & Co., of Philadelphia, announce that Wm. Edgar John, recently with Bruns, Kimball & Co., has been appointed manager of their marine supply house, which is located at 302 North Broad St.



A. Arthur Caille, president of the Caille Perfection Motor Co., of Detroit, Michigan.

Van Blerck Bulletin.

The Van Blerck Motor Co., of Monroe, Mich., forwards to us a copy of its Bulletin No. 12, containing the report on the speed, power and fuel test, recently conducted on its 1915 line of motors, which test is noticed in another place in this section.

Bear Cat.

Bear Cat, a picture of which is shown on page 38, is an interesting 20-foot Doyle model, stepless hydroplane, owned by J. E. Campbell, of Charleston, W. Va. The boat is powered with a 40-h.p. Elbridge motor, transmission being by forward gears. The boat has shown 27 m.p.h. under favorable conditions.

tions. This boat was supplied in the rough by the American Launch Co., of Bayonne, N. J.

Jones-Duncan Catalogue.

The Jones-Duncan Paint Co., of San Francisco, Cal., is putting out a new catalogue covering its extensive line of marine paints and other specialties. An interesting feature of this booklet is a strip of each available color under the various classifications, deck paint, hull paint, etc., etc.

Bruns Kimball Handle Kermaths.

The Kermath Mfg. Co. announce that Kermath motors will be handled in the Philadelphia territory this season by Bruns, Kimball & Company's branch store at 608 Arch St., where a complete stock of these power plants will be carried in 12 and 20 h.p. sizes. The New York store of Bruns, Kimball & Co., is also distributing the Kermath motor.

Canadian Association Meets.

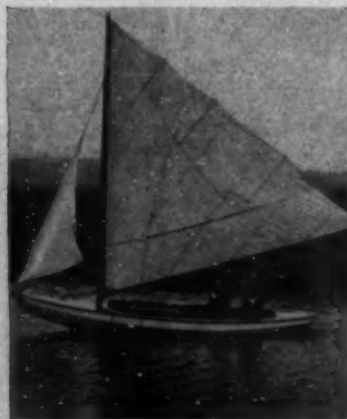
The Canadian Association of Boat Manufacturers annual meeting was recently held in Toronto. Herbert Ditchburn, of Gravenhurst, Ont., retired as president and the following officers were elected: H. W. Going, president, St. Lawrence Boat & Engine Co., Brockville, Ont.; Hugh Warnock, first vice-president, Gidley Boat Co., Penetang, Ont.; Capt. M. L. Butler, second vice-president, Butler Boat Works; Adam F. Pen-ton, secretary, of Toronto, Ont.; Claude H. Rogers, treasurer, Peterborough Canoe Co., Peterborough, Ont. The executive committee consists of Herbert Ditchburn, G. H. Robertson, H. M. Gardiner, J. B. Bastien, O. L. Hicks and John G. Robinson. The manufacturers all reported the business outlook for 1915 as being excellent. The head office of the association is at 60 Adelaide East, Toronto, Ontario.

New Loew-Victor Agent.

The Loew-Victor Engine Co., of Chicago, Ill., announces that John Paul of Gananoque, Ontario, has been appointed distributor of Loew-Victor engines in that city. Mr. Paul informs us that he has already disposed of two Loew-Victor model 30's, and looks for a most prosperous season.

Marine Equipment Co. Formed.

L. Barclay, B. P. and O. S. Weston have formed the Marine Equipment Company with offices at 729 South Los Angeles St., Los Angeles, Cal. The new company will carry a general line of hardware, knock-down frames, etc., and will run a brokerage business. The concern has been appointed Los Angeles distributor of Eagle engines and will handle a new "no crank case compression" Western Reliance two-cycle engine, made by the De Course-Dickson Mfg. Co., Inc., of Los Angeles.



Three interesting Toppan boats are shown herewith. On the left is a trim little auxiliary sailing dory, in the middle the Toppan sportsman, especially designed for hunters and selling at \$150, while on the right is this company's standard 22 foot government model dory.

Baby Doris.

Twenty feet long and five and a quarter feet broad, with 90 h.p. 4-cylinder Van Blerck motor under her hatches, the little Baby Doris owned by Mr. Cleland, of Hamilton, Ontario, is a 43-miler, as she ably showed at the Toronto exhibition races the second week in September. Baby Doris is a "Chris" Smith design, built by Mr. John Morris, of Hamilton, Ontario, on special order of Mr. Cleland.

This little boat is a single step hydroplane, and is designed and built to be used more as a family runabout than as a racer, which is quite unusual for a hydroplane in these days of mile-a-minute sensations. However, with that purpose foremost in mind, Mr. Cleland left nothing undone which might prove conducive to comfort, even at the expense of a little speed.

The power plant of the Baby Doris is a 1914 model, type C4-Special Van Blerck racing motor, rated at 90 h.p. at 1600 r.p.m., and which Mr. Cleland states develops 107 h.p. at that speed. This boat has served her owner well, and on the strength of the refinements in both boat and engine, he declares it the most satisfactory outfit in Canada.

Dream-Red Wing Houseboat.

Power houseboating is a recreation which has come into popular favor during the past few years, and this branch of boating is developed particularly in localities where the waters are protected, especially on the rivers where cruises of considerable distance, taken at leisure, are possible.

The power houseboat offers for such service many advantages over the ordinary cruiser, because it affords more room, many additional comforts, while it lacks none of the advantages of the cruiser, except,



Baby Doris, a 20-foot Canadian hydroplane, powered with a 90 h.p. 1914 model C4-Special Van Blerck racing motor, which makes her a 43-miler.

perhaps, something in the way of speed, as it is not customary to try to drive the power houseboat very fast.

A boat of this character which is particularly interesting is Dream, owned by T. Riley of Burlington, Ia. Dream has a hull 40x14 feet, scow shaped, with front and aft decks and a two-foot guard or extension on either side, making the extreme dimensions 48x18 feet.

In putting in a power plant, arrangement was made to put it beneath the floor. The controls are on the steering wheel in the bow, and after the engine is started a trap door is closed and one to enter the boat would not know there was a power plant on board. Mr. Riley installed a Model F Red Wing Thorobred, which he found exactly suited his purpose, and pushed Dream up stream at a rate of about five miles an hour. He says that once the engine is started, the trap is closed and it needs no more attention, no matter if the boat runs all day long.

Van Blerck Tests.

In November, of last year, Wilbur H. Young, of New York, went to the Van Blerck factory, in Monroe, Michigan, to personally conduct a series of tests on the 1915 models built by the Van Blerck Motor Company. The results of these exhaustive tests have been published by the Van Blerck Company, and may be had by asking for Bulletin No. 12.

Mr. Young's tests consisted of continuous, non-stop runs of ten hours at high speed and under full load and running under the identical conditions amid which these motors must operate in marine service. The results of the tests were the most satisfactory, and the motors came out of the testing room and were completely disassembled and a thorough inspection was made for signs of wear. Every part was found to be in as perfect condition after that racking exertion as before the motor went to the test stand.

This test was made on a four-cylinder, 1915 Model E4 Van Blerck motor, timed for 1,500 r.p.m., and the average speed for the ten hours was 1,505 r.p.m., developing an average of 81.56 h.p. for the run, which is 16.56 h.p. in excess of the rating given this motor at 1,500 r.p.m. The economical fuel requirements of this engine, per brake horsepower hour is shown in the fact that but .90 pints were required per h.p. hr., and a total of only 92.5 gallons for the entire run under full load and at high speed.



The launch Red Wing, in use on Green Lake, Wisconsin and powered with a 24 h.p. Anderson engine.

The Van Blerck 1915 models adhere to the policy of the company with respect to specialization on one type, without any excuses to offer, whatever. The new models have throughout but one size cylinders, 3 1/2-inch bore by 6-inch stroke, and range in motor sizes from two to eight cylinders, with a radius of horsepower from 20 to 180 h.p. They are built for three distinct uses, namely, fast runabout and fast cruiser work, large runabout and pleasure launch service, and cruisers up to 63 feet in length.

Jasco and Safety First.

To-day the "Safety First" movement has become almost a national institution. Its days of "faddism"

have been passed through, it has weathered the humorous shafts of hard-pressed metropolitan joke-smiths, passed the stormy capes of "The Newest Craze" and "Conservative Prejudice." Its message has been delivered thoroughly to every thinking American, has become a part of the daily duties. But it is after all, in private life, under the jurisdiction of the individual, that the great responsibility rests. And this responsibility is nowhere more important than it is in pleasurable pursuits. The man who sets out, with family or friends, for a day's motor boating or automobilism does not want to think that he has left any stone unturned to insure the absolute safety of his passengers.

Janney, Steinmetz & Company, of Philadelphia, make the "Jasco Tank"—have been making it for 15 years, though it is only within recent years that it has been sold under its present trade name. According to the firm's own concise description it is a "seamless, leakless, drawn-steel, tinned and tested receptacle for the carrying of gasoline and other fluid fuels." Yet in that one little word "leakless" lies the whole essence of its success.

The "Jasco Tank" is a safety proposition first and last. With such a product it was natural that Janney, Steinmetz & Company should go into the "Safety First" campaign with a zest. The substantial increase in their business is proof positive that the public appreciates and is taking full advantage of "Safety First" when it comes to protecting motor boat and motor car. The company reports business prospects for the coming season as being most flattering.

Two Van Blerck Boats.

A clean-running and comfortable an express cruiser as can be found on the Great Lakes is the Bo'm, built in 1912 for Commodore C. B. Lockwood, of Sandusky, Ohio, by the Church Boat Company, of Sibley, Michigan. Bo'm is a 45-footer, by 6 feet beam, powered with a Van Blerck C6 motor. Her speed is 27 miles an hour, and she rides as comfortably under full throttle as at half speed.

Her arrangement throughout is the most unique, every detail of her finish being of the same high class as her outward appearance presents.

Chinook is another Van Blerck powered Church hull, also owned by Commodore Lockwood. She was built five years ago at Church yards, at Sibley, Michigan, and powered with another motor of the same size as her present Van Blerck. However, since the installation of her 6-cylinder, 5 1/2x6-inch Van Blerck motor, last summer, she has gained six to seven miles an hour over her best speed with the former motor installation.

Chinook is 40 feet length, overall, by 6 1/2 feet beam, and with her C6 Van Blerck motor, attains a speed of from 26 to 27 miles an hour. She is a clean cut, attractive little boat, but the wide wings of spray she throws indicate clearly the progress in design made by the Church Boat Company, between the time she was built, and the design of Bo'm.

Kahlenberg Line.

Kahlenberg Bros. Co., of Two Rivers, Wis., U. S. A., announce their 1915 line now ready, and while a few improvements have been made no radical changes have taken place. In addition to their regular line of gasoline and distillate engines they furnish their standard engines with a kerosene burning device. This device, while it is termed "kerosene attachment" will just as well use gas oil, alcohol, and stove distillate. When attaching this equipment, due care was taken that this equipment would not interfere with the well-known reliability of the "Kahlenberg" gasoline or distillate engine, and so the change from one fuel to the other could be made instantly by the mere movement of a small lever.

The "Kahlenberg" standard engine is made in sizes from 2 h.p. up to 45-54 h.p. The Kahlenberg company also manufactures a heavy duty oil engine, which is made in sizes 55 h.p. and larger. These machines



Elk, an interesting house-boat in service on the Mississippi. She is powered with a model F Red Wing Thorobred motor, which gives her 8 m. p. h.

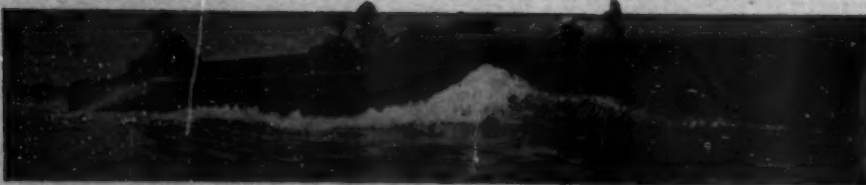
are built along the general lines of the "Kahlenberg" standard engine, with the mere difference that they operate on the semi-Diesel principle. Each cylinder is supplied with an individual fuel injection pump and the fuel oil is pumped directly into the combustion chamber under pressure.



Left hand oval: Valley steplon hydroplane, powered with two Curtiss Johnson 2 cylinder, 3 x 3 Bud-E motors. Oval on right: 20 foot Grzech hydroplane with two 2 cylinder 4 1/2 x 4 inch Bud-E marine motors with twin screws.



Lower picture, the two Bud-E motors that form the power plant of the Grzech hydroplane pictured above. The motors are rated at 11 h.p. each and the boat is claimed to show a pretty turn of speed.



Nosidda, a 28-foot express runabout, owned in Buffalo, N. Y., and powered with a 20-35 h.p. Sterling motor. Speed 23 m.p.h. and winner of three out of five races at Buffalo club regatta.

Hunter-Van Blerck.

The Hunter-Van Blerck, as well as being an attractive combination of boat and engine, is a combination of two well-known names in the marine engine and boat-building industries. Early last spring the Everett Hunter Boat Company, of McHenry, Illinois, built the boat shown in the illustration and installed under her mahogany hatch a 1914 Model B6-Special Van Blerck motor, built by the Van Blerck Motor Company, of Monroe, Michigan. The boat was named for the men who designed and built the hull and power plant. She was launched early in the season, and throughout the summer gave a very good account of herself.

Hunter-Van Blerck was built primarily for comfort, being 30 feet length overall by five feet, six inches beam, and having every refinement conducive to that end.

Hunter-Van Blerck's power plant is a B6-Special six-cylinder, 75 h.p. Van Blerck motor, five inches bore by six inches stroke, fitted with aluminum crank case and electric self starter and lighting outfit. The normal speed of this medium duty Van Blerck motor is 1,000 r.p.m., and running at that speed gives this boat twenty-five consistent miles an hour.

St. Louis Yacht & Boat Co.

The Saint Louis Yacht and Boat Company, has been formed by a syndicate of St. Louisians with a capital stock of \$60,000.00, and has taken over the Sparks Boat and Engine Company of Alton, Ill., and the Motor Car and Boat Company of Saint Louis.

Pending the construction of a larger plant in Saint Louis, the Alton shop with its marine railway and yards will be utilized, the facilities of this plant having been increased for the construction of boats up to 100 feet in length.

The new Saint Louis plant, which will be finished in the spring, is of reinforced concrete fireproof construction.

The Saint Louis Yacht and Boat Company has been organized in response to the demand for a concern for the construction and care of boats in the Mississippi Valley. A designing department with Walter D. Beausis at its head; and service, engineering, sales, advertising and purchasing departments have been organized. The general offices of the company are in Suite 1548-1551 Pierce Building, Saint Louis. A stock of engines, marine equipment and marine hardware is maintained both at Saint Louis and at Alton.



Traffic, a Tams, Lemoyne & Crane launch owned by the Cape Cod Construction Co., and powered with a 3 cylinder 18 h.p. Loew-Victor engine.

The Toppan Sportsman.

This little boat is one of the best sellers of any of the cheaper boats on the market. The boat makes an ideal one for fishing and hunting and is especially designed for this class of work. They are built in large numbers by the Toppan Co., and this keeps the cost down. The stock equipment is the two h.p. motor which drives the boat over a measured course seven miles per hour. It is a wonderful boat in rough water. It is a little under five feet beam, has extra wide stern with horseshoe seat and there are two cross seats forward, also a short forward deck to cover the tank. The boat is pine planked and galvanized fastened, extra value for \$150.00. It has extra thick bottom, oak timbers, oak stem and cypress back board, extra heavy knees, and dead wood, oak skeg which protects the propeller. This boat can be equipped with three h.p. Gray motor for \$10 additional or \$160 for the complete outfit.

Van Blerck Parts Analysed.

The reciprocating parts of the recently announced 1915 line of Van Blerck motors are the pistons, connecting rods, valves and push rods. At a glance it is plainly evident that these are the parts subjected to the severest wear and strain in any high-powered, high-speed engine, and the care with which they are designed, cast, ground and fitted, and also the materials that constitute these parts, determined almost entirely the length of the life of usefulness of any internal combustion engine.

The pistons are first to be considered, for it is their successful resistance of the explosions in the cylinders, transmitted through the connecting rods, that gives the engine all of its action. They are a composition of semi-steel gray iron castings, so thoroughly wear-proof that in Van Blerck motors they have run many successive seasons without having a piston replaced.

The connecting rods are always brought in for their due share of the wear and tear attendant upon continuous marine motor service, and to offset the action of friction and strains, the Van Blerck Motor Company has provided all of its motors with connecting rods of chrome nickel steel drop forgings. These forgings are treated at 1530 degrees Fahrenheit, and drawn at 1030 degrees. A test shows elastic limit of 90,000 pounds with elongation of not less than 18%.

The valve in these Van Blercks are of the highest grade Tungsten steel and are capable of resisting heat greatly in excess of any found in any cylinder,



Hunter-Van Blerck, a 30-foot runabout, built by the Everett Hunter Boat Co., of McHenry, Ill., and powered with a B6-Special Van Blerck, six cylinder, 75 h.p. motor.

even when running at top speed. Their hard and accurately fitted crowns maintain a maximum of compression, never break and eliminate the necessity of frequent reseat.

The push rods, machined from nickel steel, are hollow, thus greatly lightened, and it naturally follows that their action is decidedly quickened by their unusually light weight, assisting greatly in the maintenance of satisfactory compression. The rollers and roller pins, on the lower end of the push rods, are also of nickel steel and hardened to the most efficient point.

Valentine Established in 1832.

In the advertisement of Valentine & Company, which appeared in our December number, it was stated that the concern was established in 1832. This was just sixty years out of the way, as it had its origin in

more up-to-date quarters in the Singer Building, 85 Liberty Street, New York City. Their new home will contain upwards of 2,000 square feet of floor space, which will enable them to handle to advantage their constantly increasing business, such as dispensing Van Blerck, Stanley, and Standard marine motors, in addition to their full line of motor boat accessories.

A Correction.

On page 32 of our December issue, under the list of American motors, it was stated that the Morristown motor is manufactured at the new works of the Monitor Boat & Engine Company. This is, of course, erroneous. The Morristown motor is manufactured by the Morristown Boat & Engine Works at Morristown, New York.

Johnson with Northwestern.

Will C. Johnson, a well-known motor-boat man throughout the Middle West, has accepted the position as manager of the Service Department of the Northwestern Motor Company, of Eau Claire, Wisconsin. This company has for many years made a practice of shipping every engine they sell out on thirty days' trial, to be returned and "no questions asked" if the motor is unsatisfactory. In these times of close competition engine manufacturers fully realize that it is not only necessary to make sales, but to keep the customer satisfied at all times. When the motor-boat

Scripps Expands.

Double shifts of contractors' crews in the last ten days have shot their scaffolding up around the Scripps Motor Company plant in Detroit, and now are making the "model plant" another story bigger. The additional floor now being added to a part of the plant will increase the factory floor space by 150 feet by 40 feet.

This newest unit to the Scripps plant will house the offices of the enlarged export department now being brought to the factory from New York City, and those offices which have overflowed the original space designed for them. Pattern and Tool rooms also will be brought into the new structure, affording more room in the plant proper for necessary production expansion. The building is being done under pressure, and it is expected the new offices will be ready for occupancy by the first of the year.

The plans for increasing the capacity of the plant to care for the expanding business, both at home and abroad, and to insure prompt deliveries in 1915, were given the final O. K. by the directors of the company at their recent annual meeting, when they also authorized an increase in the capitalization to a quarter of a million dollars. A change in the general officers of the company, as installed by the recent election, will be noted: William E. Scripps, President; A. J. Downey, Vice President; T. F. W. Meyer, Treasurer, and R. V. Warman, Secretary, who also continues as director of export sales.

A new series of enclosed motors is being added to the Scripps marine motors line for the coming year. These are now being shown to dealers by Mr. E. H. Allen, whose appointment as a traveling special sales representative for the Scripps motors, was recently announced.

Loew-Victor Busy.

The Loew-Victor Engine Company factory continues to run day and night in an effort to keep up with orders. Plans are now being drawn for an extensive addition to the factory. There is no war talk or business depression in the Loew-Victor organization.

W. J. Condon, factory representative of the Loew-Victor Engine Company on the Pacific Coast, is in Chicago on his annual visit to the factory, and is making arrangements for shipment of a complete line of Loew-Victor and Harbeck Engines for exhibition at the San Francisco Fair. Mr. Condon is enthusiastic about the performance of Loew-Victor Engines on the Pacific Coast, and as a Christmas present to his sales manager, brought home with him a contract for 57 of the Model 11-12 H.P. Loew-Victor Engines for installation in life-boats.

Gasoline Engine Equipment Co. Moves.

The Gasoline Engine Equipment Co., who have been located for a number of years at 133 Liberty Street, New York City, have outgrown their present quarters and removed on January first to much larger and



Bear-Cat, a 20-foot Doyle model stepless hydroplane by the American Launch Co., of Bayonne, N. J. She has a 40-50 h.p. Elbridge motor.

MOTOR BOATING ADVERTISING INDEX

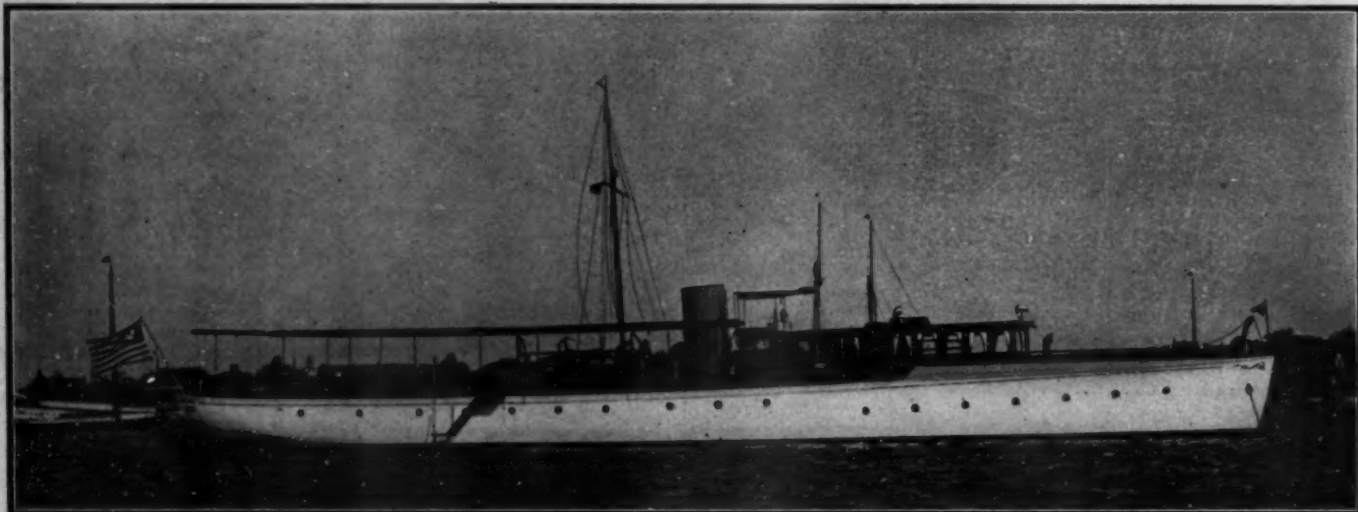
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Naval Architects
and
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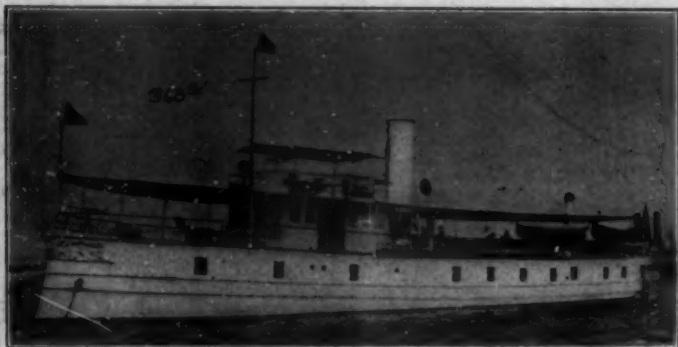
COX & STEVENS

15 William St., New York
Telephone—1375 Broad.
Cable—BROKERAGE.

We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTE. A few are shown on this page. Plans, photographs and full particulars mailed on request



No. 885.—For Sale or Charter.—Exceptionally handsome, fast, steel, twin-screw cruising power yacht; 118 x 16.6 x 5 ft. Built from our design. Speed up to 18 miles; three double staterooms, main and dining saloons, two bathrooms, electric lights, etc.; handsomely finished and furnished. Probably the most desirable proposition ever offered in a large gasoline yacht. Apply to Cox & Stevens, 15 William St., New York.



No. 363.—For Sale or Charter.—The most desirable house yacht available. Luxuriously furnished. Splendid accommodation. For full particulars, plans, etc., apply to Cox & Stevens, 15 William St., New York.



No. 2247.—Exceptional Bargain.—Twin-screw, flush deck, cruising power yacht; 90 x 15.3 x 4.9 ft. Built 1912. Speed 13-14 miles. Three double staterooms, large main and dining saloons, bath, two toilets, separate galley, etc. Independent electric light plant. Cox & Stevens, 15 William St., New York.



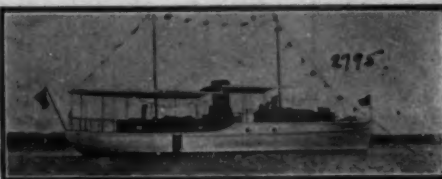
No. 964.—For Sale at Bargain or Charter.—Attractive twin screw cruising power yacht; 78 x 14 x 3.6 ft. Best construction and finish. Speed 12-13 miles; two 40-50 h.p. Standard motors. Three staterooms, bath, dining and main saloons, etc. Immediate sale desired. Cox & Stevens, 15 William St., New York.



No. 2134.—For Sale.—71 ft. twin screw gasoline cruiser. Built 1912. Speed 13 miles, two 35-45 h.p. 20th Century motors. Dining saloon and galley forward, engine room amidships; main saloon, double stateroom, bathroom, etc., aft. Price attractive. Cox & Stevens, 15 William St., New York.



No. 1692.—For Sale.—Attractive cruising power yacht; 66 x 13 x 4 ft. Recent build. Speed 11-12 miles. Two double staterooms and bathroom; dining saloon, galley, etc. Electric lights. Price low. Apply to Cox & Stevens, 15 William St., New York.



No. 2795.—For Sale or Charter.—Now in Florida waters. 55 ft. bridge deck cruiser. Built 1914. Speed 10 1/2 miles. Standard motor. Dining saloon and galley forward, two double staterooms and toilet aft. Cox & Stevens, 15 William Street, New York.



No. 2890.—Bargain.—Modern bridge deck cruiser; 50 x 11 x 3 ft. Built 1914. Speed 11 miles. 20th Century motor. Large galley, dining room and toilet room forward, engine room amidships, next aft double stateroom with toilet, etc. Large deck space. Splendid condition. Cox & Stevens, 15 William Street, New York.

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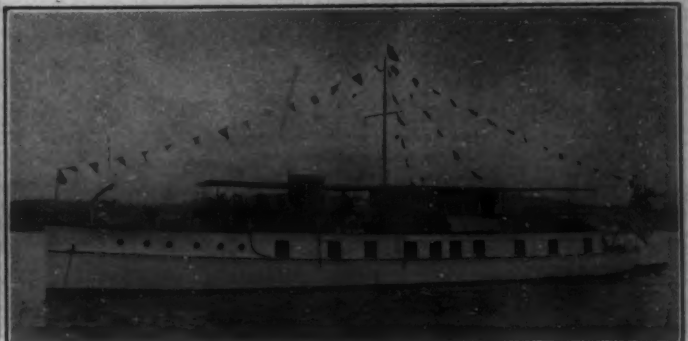
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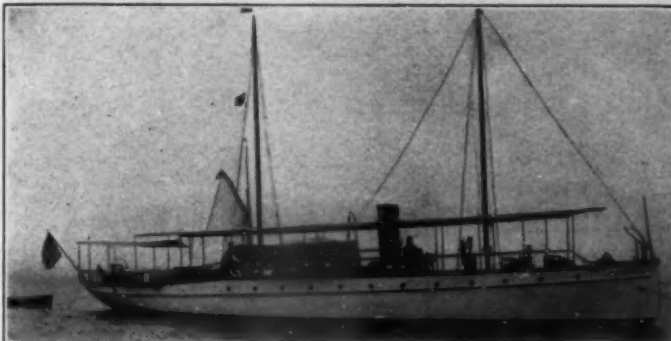
All the best craft, every size and type, available for Sale and Charter. Full particulars upon request. Handsome Illustrated Yacht List showing 200 photographs sent free to buyers.



7094.—98-ft. Twin Screw Coast Cruiser. 5 staterooms. 2 baths. All modern conveniences. In commission Florida. Can be chartered. Stanley M. Seaman, 220 Broadway, New York.



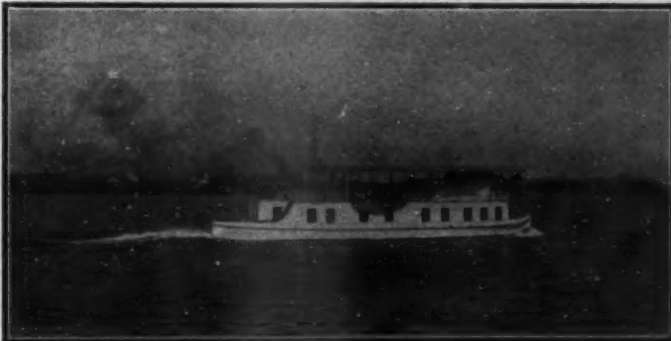
7744.—Ideal Twin Screw Cruiser. For charter. 95 x 19 x 3.3. 4 double staterooms. All modern conveniences. Speed 12 miles. In commission. Stanley M. Seaman, 220 Broadway, New York.



6735.—85-ft. Shoal Draught Cruiser. 3 staterooms. Large saloon. Bath. Speed 12 1/2 miles. In commission Miami, Florida. Available for charter. Stanley M. Seaman, 220 Broadway, New York.



7300.—Twin Screw 80-foot Elco Cruiser. 3 1/2 ft draught. 3 staterooms. Bath. Speed 13 miles. Perfect condition. Stanley M. Seaman, 220 Broadway, New York.



7831.—For Sale or Charter.—70 x 18 1/2 x 2. 3 staterooms. Bath. In commission Jacksonville, Fla. Stanley M. Seaman, 220 Broadway, New York.



7679.—63 ft. Coast Cruiser. Launched 1913. Practically new. Elegant condition. Low price. Stanley M. Seaman, 220 Broadway, New York.



7804.—50 x 12.10 x 2. Sleep six. Two 25 h. p. Standard. New 1914. Fine sea boat. Ideal for Florida. Stanley M. Seaman, 220 Broadway, New York.



7747.—45-foot Cruiser. Launched 1913. Speed 11 miles. Bargain. Stanley M. Seaman, 220 Broadway, New York.

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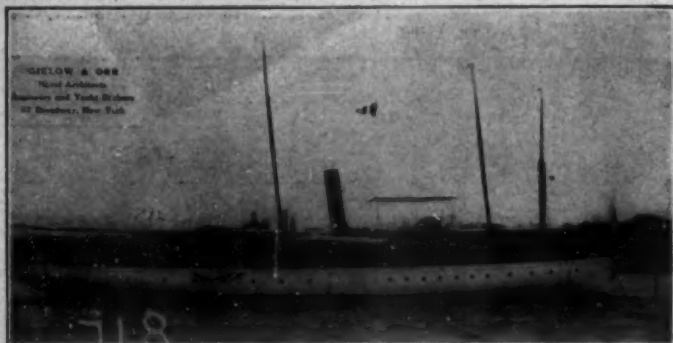
The following attractive boats are offered for sale and charter. Large number of others to select from are listed with us for sale. Yachting in Florida next Winter promises to be very active. To secure the choice yachts early decision is advisable.



No. 4855.—For Sale.—Twin screw motor yacht, 97 x 16.6 x 4 feet draft. Built 1911. Two 6-cylinder air starting and reversing Standard motors, 125 H.P. each. An unusually well arranged boat with excellent accommodations. Now in Florida.



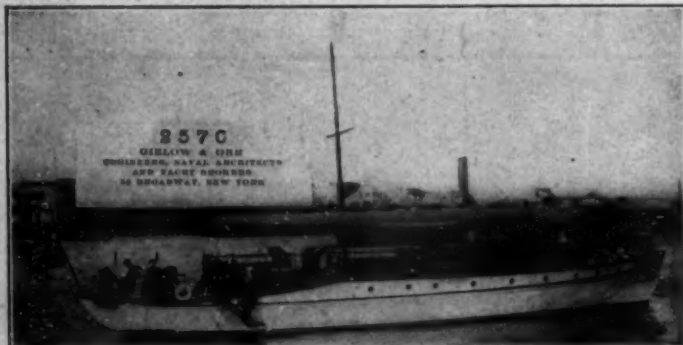
No. 4985.—For Sale.—35-foot Elco express. Built 1913. Used one season. Six-cylinder 60 H.P. Elco motor with electric self-starter and lighting outfit. Foot pedal operating and reversing gear. Mahogany hull. Decided bargain.



No. 718.—Bargain.—Handsome flush deck steam yacht 125 x 18.3 x 5.3 draft. Three double and two single staterooms. Two bathrooms. Two deckhouses. Speed 12 knots.



No. 2958.—For Sale.—120-foot twin screw "express" steam yacht, speed up to 24 miles. New water tube boiler 1914. Machinery, hull and equipment complete and in excellent shape. Reasonable.



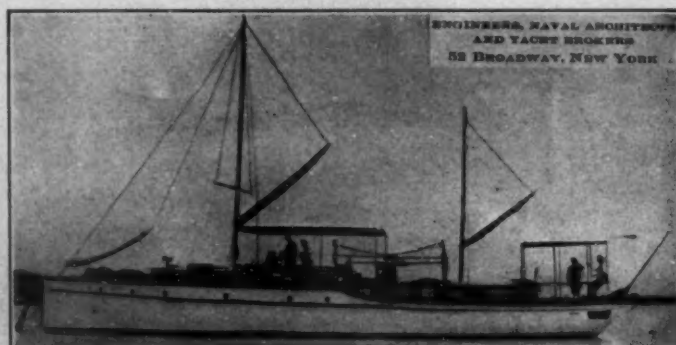
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No. 1055.—For Charter.—Now in Florida. Short or long periods. Twin screw power houseboat 106 x 20.6 x 3.4 draft. Four double staterooms. Two bathrooms. Hot water heating plant. Electric lights. Reasonable.



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No. 4606.—For Sale.—Cruising motor boat, 65 x 12.6 x 4 feet draft. Built 1913. 60 H.P. 6 cylinder motor. Electric lights. One double and one single stateroom. 11-foot cabin. Bathroom. Very seaworthy craft.

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FRANK BOWNE JONES, Yacht Agent

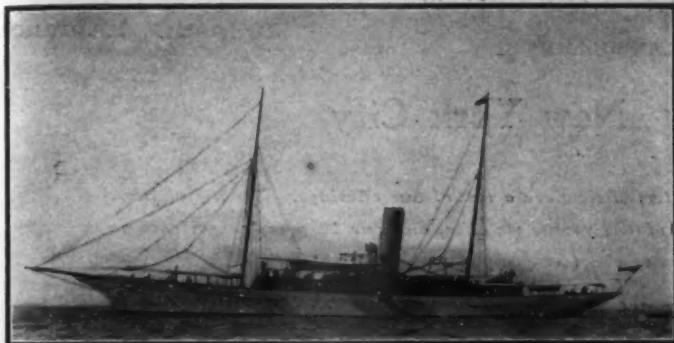
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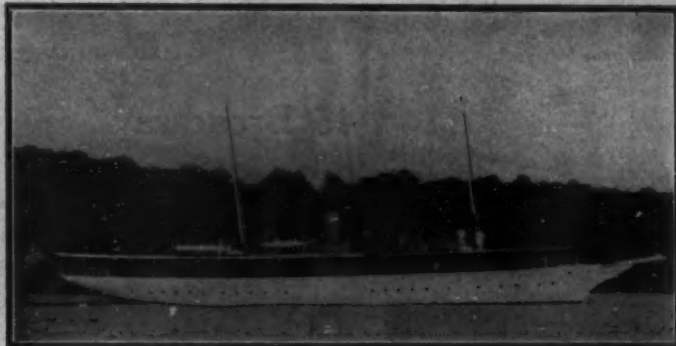
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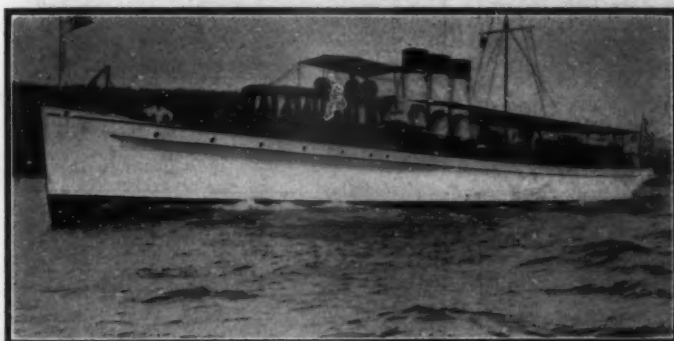
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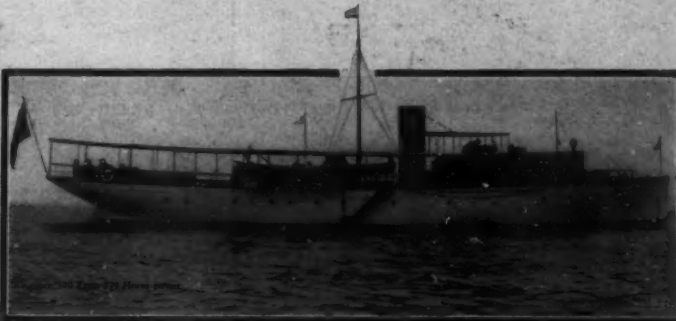
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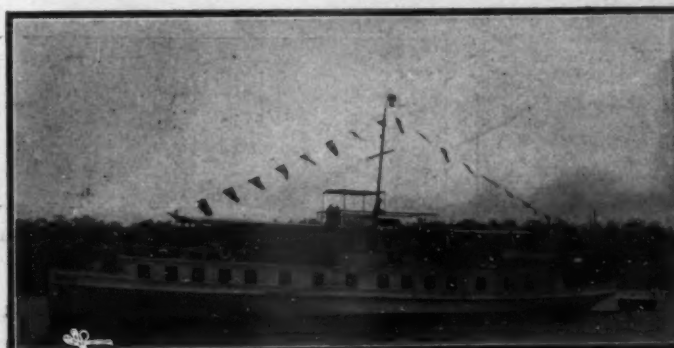
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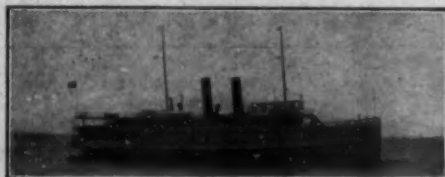
No. 3155.—500-ft. Ocean cruiser. Fit to go anywhere. Roomiest yacht afloat.



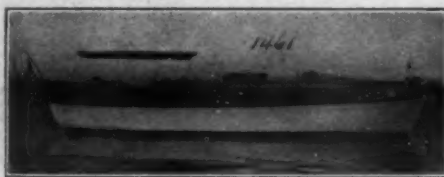
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No. 4150.—90-foot Steamer. Suitable for pleasure or commercial purposes. Speed 12 miles.



No. 5000.—175-foot passenger and freight steamer; 30 staterooms. Speed 13 knots.



No. 1461.—40-foot cruiser; sleeps four people. Standard motor. Speed 10-11 miles.



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No. 1238.—75-foot twin-screw cruiser. Three staterooms, dining saloon, bathroom, etc.



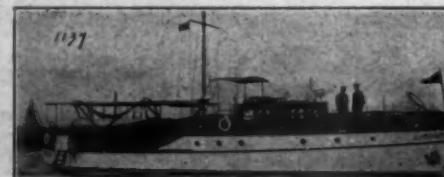
No. 943.—95-foot twin-screw cruiser. Three staterooms, saloon, bath, etc.



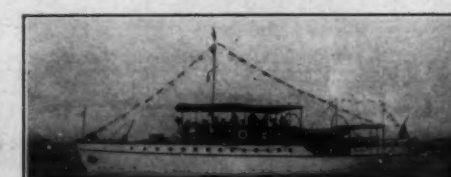
No. 1121.—50-foot cruiser. Two saloons, stateroom, bathroom, etc.



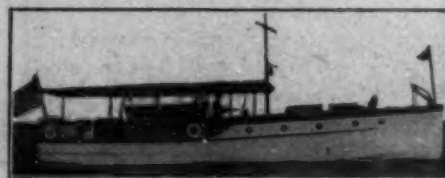
No. 1437.—Sale or Charter.—73-foot cruiser. Two double staterooms, large saloon, bathroom. Standard motor. Speed 12 miles.



No. 1137.—60-foot twin-screw cruiser. Three staterooms, two toilet rooms, saloon and dining saloon.



No. 1102.—57-foot cruiser; three staterooms, bathroom, etc. Speed 12 miles.



No. 1495.—50-foot cruiser, new 1914. Stateroom and saloon sleep six. Speed 12 miles. Price reasonable.



No. 1342.—50-foot cruiser. Stateroom and saloon sleep six. Price reasonable.



No. 1503.—25-foot Elco Express Yacht Tender. Practically new. Speed 23 miles. Price \$1,200 for quick sale. Cost \$3,000.

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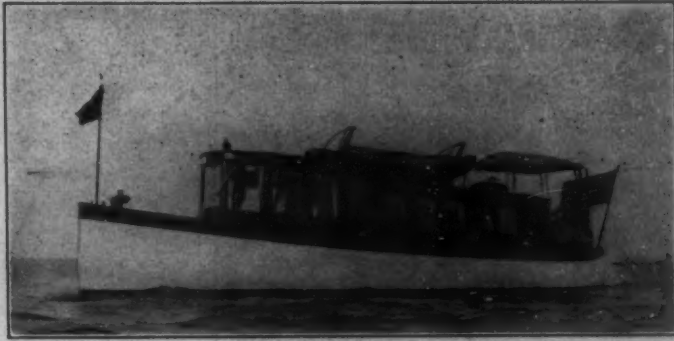
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All types of yachts and vessels for sale and charter. Anyone wishing to buy, sell, charter, exchange, insure, or have appraised, designed and built, any style of craft, is cordially invited to consult us.

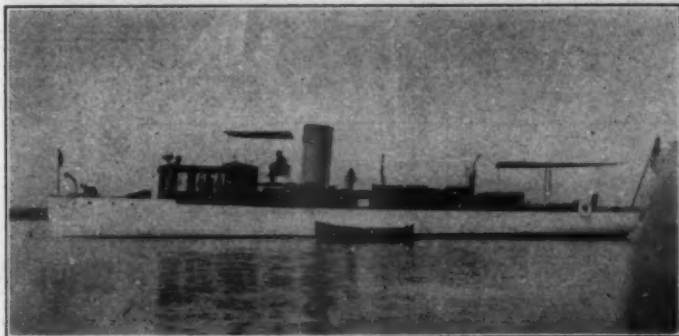
Below are a few offerings from our comprehensive list.



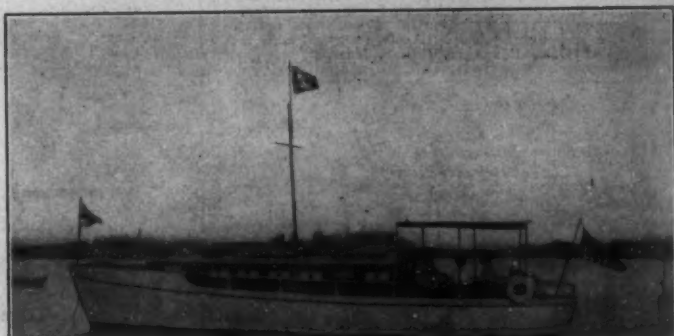
For Sale—39-foot motor boat, 9 feet beam. Built 1907. 20-24 h.p. four-cylinder Murray & Tregurtha motor. 10-foot cockpit. Roomy cabin with one stateroom. Complete equipment. Price \$1500. Can be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



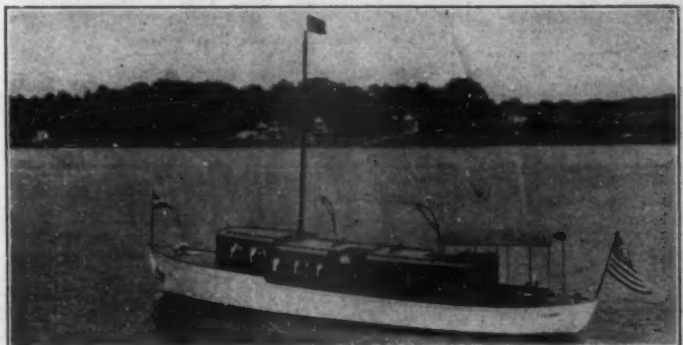
For Sale—40-foot Murray & Tregurtha built launch, 9 feet 6 inches beam, 3 feet draft. 24 h.p. Murray & Tregurtha motor. Speed 10 miles. A genuine bargain, as she can be purchased for a sixth of her cost. Can be seen in Boston by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



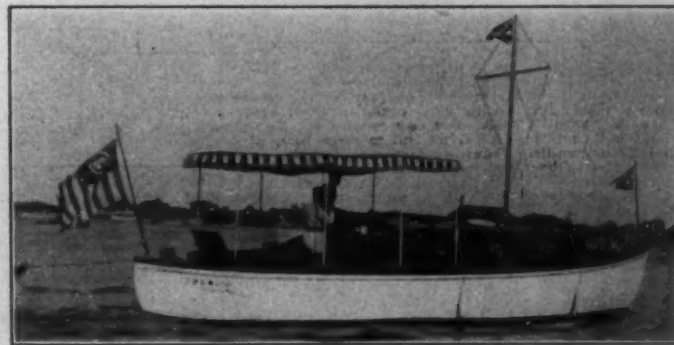
For Sale—Exceptional Bargain. 71-foot steam launch. Built by Lawley. Triple expansion engines. Roberts water tube boiler. Speed 14 miles. The finest boat of her type in Boston waters. Apply to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



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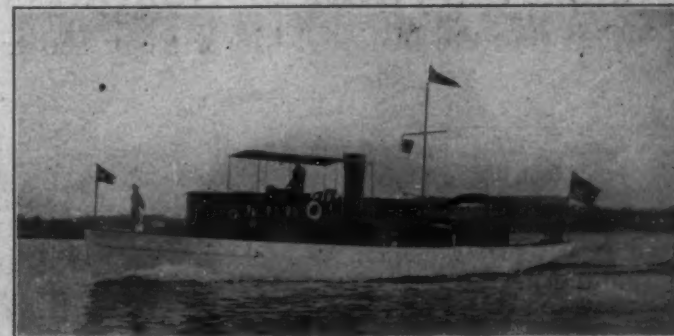
For Sale—45-foot power cruiser. 16 h.p. Standard motor. Lawley design. Just the boat for southern cruising as her draft is only 3 feet. Mahogany finish. Complete equipment. Can be seen in Taunton, Mass., by applying to Hollis Burgess Yacht Agency, 15 Exchange Street, Boston, Mass.



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February 27th to March 6th

Complete data on both shows will be given, including all exhibits. This issue will be a comprehensive record of the two big shows of the season.

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EAST GREENWICH RHODE-ISLAND

The Terrible Underwater Motor Boat.

(Continued from page 9)

surface. When running submerged it is impossible to use the engines, due to the fact that air is needed for the combustion of the fuel as in the gasoline engine. This, of course, would soon exhaust the available air supply. Moreover, if the engines were operated when running under water the exhaust would leave a tell-tale trail on the surface and disclose the presence of the submarine to the enemy. For this reason electric motors, driven by storage batteries, are used when running submerged. This arrangement gives a submerged speed of about 10 knots, the power of the motors being about 700 h.p. The storage batteries are charged after an under-water run by using the motors as generators, driving them with the Diesel engines, while at rest on the surface. The use of the motors also ensures a constant load while operating under water, while if the engines were used and fuel consumed there would be a changing weight which would be difficult to take care of. The arrangement of the engines and batteries and motors is clearly shown in the arrangement plan given. The batteries are located forward of amidship and the motors aft of the engine.

The storage batteries serve other useful purposes besides that of propulsion. They ensure a supply of electricity for running the various auxiliary motors connected to the pump, steering gear, anchor hoists, etc., and also for cooking and heating. Obviously, fires of any kind could not be used while submerged, so the supply of electricity is very valuable.

In submerging, the submarine destroys its buoyancy by filling the ballast tanks with water. This is accomplished from the midship control compartment by throwing levers which open the Kingston valves to the various tanks. These tanks are located at the ends of the boat, under the battery, etc., and are so arranged that a perfect balance is maintained when they are filled. A central control tank, located under the central compartment, is used for sensitive control, and is the last one filled in submerging. In preparing for diving, the main ballast tanks are filled, which puts the boat in the awash condition. The central tank can then be filled at will. Nearly all the submarines submerge by diving. The dive is made by throwing the aft horizontal diving rudders when underway, which sends the boat under at a small angle. To bring the boat to the surface again, the tanks are blown by compressed air. This air is carried under 2,500 lbs. pressure in heavy cylindrical tanks called air flasks, and can be used for replenishing the air supply if need be, as well as blowing the ballast tanks. These air flasks are charged when on the surface by air compressors located aft the main motors and geared to the main shaft. Compressed air is also used in charging and firing the torpedoes.

The torpedo tubes are generally all located forward, although sometimes one is carried aft. The general arrangement is either two or four tubes forward with several spare torpedoes which can be loaded into the tubes as soon as the other ones are fired. The standard torpedo is 17 feet long and weighs 1,500 lbs. It is an exceedingly ingenious device, being driven by single or twin screws operated by compressed air engines. The air for operating these engines is stored in the torpedo under high pressure, being obtained from the air compressors, as already explained. The torpedo has a speed of nearly 35 knots and can be completely controlled by vertical and horizontal rudders, which are set just before firing. In firing, after the outer tube doors are opened, compressed air is admitted behind the torpedo, and it is simply forced slowly out of the tube. Just before the aft end of the torpedo clears the tube a projection on the tube strikes a trigger on the torpedo. This starts the compressed air engines and the torpedo starts off for its mark at a tremendous rate. The mechanism and detail of the torpedo is extremely complicated and interesting, but beyond the scope of this article.

The submarine is controlled from the central compartment. Here are located two periscopes, one for the helmsman and another, capable of being turned around the whole horizon, for the commanding officer. Above the central compartment is a conning tower, from where the boat is controlled in the awash condition, the lights of the conning tower being kept just above the surface. When the enemy is sighted the boat is completely submerged, the upper end of the periscopes alone remaining out. On approaching the enemy the submarine runs deeper, so that the periscopes are completely submerged, and the boat is then steered entirely by compass. The boat is under complete control of the man at the diving rudder (one of the wheels shown in the central compartment) and can be brought up occasionally to take a sight of the enemy.

In attack, the boat is brought to a standstill or to a low speed, depending on the movement of the enemy, with the periscopes just above the surface. While the boat is being maneuvered around with the screws until she heads directly at the enemy, the men forward are opening the outer tube door and seeing that everything is clear for firing. At the proper moment the commanding officer at the periscopes, which is equipped with a range-finding apparatus, fires the torpedo by pulling a relay valve. The boat can then be quickly submerged and no trace of her presence revealed.

The submarine is comparatively a safe boat. A number, of course, have been lost, and these facts have been brought strongly to the attention of the public. There is, however, very little danger if they are kept under proper control. The submarine is extremely sensitive, and has very little fore and aft stability when under water. For this reason there is very little moving about of the men when running submerged. Most of the boats have been lost by being struck while the periscopes was under the water; by entrance of water through partially closed hatches while in the awash condition; by sharp and sudden dives to too great a depth, or by explosion of gasoline vapor. All of the boats are now equipped with electric and hand pumps for emptying the tanks in case of accident to the compressed air system. Many are equipped with drop keels, which can be quickly released in case of accident, and a number of boats have been saved by this means. Marker buoys are also provided on all the recent boats. These are released in case of accident to mark the position of the submarine. Some of the marker buoys are fitted with electric lights, and practically all of them have telephones so that those on the surface can communicate with those within the disabled boat. Air locks and specially-designed escape hatches are also provided as a means of escape in the last resort.

(Continued on page 48)

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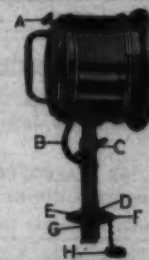
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The Terrible Underwater Motor Boat.

(Continued from page 47)

As regards size and number of submarines, England, Russia and France have the best fleets among the European nations. Russia has the largest and most powerful boats. These are 230 feet long by 21 feet beam, of nearly 1,000 tons submerged displacement, and are capable of a surface speed of 17 knots.

Probably the most interesting feature of the submarine to McTorr Boating readers is the Diesel engine, for in the end all the power comes from these, as it was pointed out that they are used not only for propulsion, but charging the storage batteries and air tanks.

The standard engines of the United States boats are the 450 h.p., two-cycle Nuremberg engines, as shown in the illustration. These are six-cylinder engines with an air compressor on the forward end. The fuel is heavy petroleum oil, costing from three to five cents a gallon, and is carried in structural tanks built into the hull under the engine. On long surface runs some of the ballast tanks are filled with a reserve supply. The fuel is pumped to the cylinder, and is there sprayed in under heavy air pressure. The air compressor, located on the forward end of the engine, is used to spray in the fuel and for storing air for starting and reversing, the air being stored in flasks carried beside the engine. The engine is controlled by the control wheel at the forward end. This wheel controls some very elaborate and unique mechanism, and is equipped with stops and safety arrangements. By simply turning this wheel the engine is started by compressed air and by further turning, after the engine is turning over, the fuel supply is turned on and the engine brought up to speed. Turning the wheel in the reverse direction stops the engine and reverses the valves and starts it in the same manner in the opposite direction. The valves of the engine are located on top and are driven by a camshaft, as shown in the illustration. The engine has stepped pistons, the lower part (or step) of the piston being simply a low-pressure pump for pumping air to scavenge the cylinder of burnt gases between each explosion. The Nuremberg engines have been described in McTorr Boating, and the submarine type is little different from the commercial type, except it is lighter and runs at higher speed. The submarine to-day is limited only by the size of the engine attainable, so that increase in the size of Diesel engines will see increased sizes of submarines.

Possibilities of the Small Boat.

(Continued from page 15)

side seats 4 feet long. The tops of these seats come flush to the top of the cross seat. An icebox is situated under the seat on the port side. Except where the icebox and toilet appear, entrance to the lockers is obtained on the sides through spring-hinged doors. For sleeping purposes a new, novel and entirely practicable idea has been instituted, most of the credit for which must be given to Mr. D. I. Whittlesey, who greatly improved on my original plan for hinged door extensions.

Instead, as the drawing shows, the side seats have removable upholstered backs. To make up the two forward bunks, these backs are taken down and fastened to the front of the side seats with small brass catches. The inner edges of the extensions are supported by portable oak stanchions held in place in the floor and seats by dowels. There is a seven-inch clearance between the extended seats, which means that you can sit on the edge of your bunk with your legs hanging over to take off your shoes, and it also provides a convenient walking space. For this idea I am also indebted to Mr. Whittlesey.

The attractiveness of this arrangement forward is that during the day two comfortable lounges are provided for your lady passengers, on which they can recline, luxuriously cushioned, while at night you have two bunks six feet three inches in length and about two and a half feet wide! What thirty-foot cruiser can give you better accommodations than this? Another important comfort point is the one foot of space provided between the forward end of the seats and the forward locker bulkhead. This gives the steersman a face forward steering position. Haven't you often wished for this in your flush side-seated small boat?

The forward deck is about six feet in length. This gives you wonderful storage space in addition to your stern and seat lockers. Under the deck is a fifteen-gallon fuel tank, giving you a sufficient supply with the power plant I have mentioned of about sixteen hours' running. The floor is carried through to the bow, so that this forward locker is free of bilge dampness.

The seating and sleeping arrangement aft is very different. Here no permanent seats would be practicable, as easy access to the engine is always greatly to be desired. The engine itself is covered by a water-proof box, with hinged lid. The clutch is also boxed. There is a clear space of one foot between the engine box and amidship bulkhead, where one can stand in turning the flywheel.

On each side of the after compartment are seats hinged in such a manner that they drop flush against the planking when not needed. When raised they are supported in a manner similar to the seat extensions in the forward cockpit. Care is taken also to have them flush with the after cross seat. These drop seats are cushioned or upholstered, preferably the latter. There is also a cushion on the stern seat. The side drops are so made that they are wider at their after ends. This gives a broad space for the upper part of the sleeping person's body to rest, his legs occupying the narrower portion forward by the engine. With their heads resting on pillows placed on the stern seat, two persons are given comfortable bunks as long and almost as wide as those forward. Easy, now you know how, isn't it?

The stern seat is permanent and the space under it, and the stern deck furnish no locker rooms.

Another important feature of this boat that should be especially commented upon is its system of double control, which is of inestimable value. The steering arrangement is so constructed that the steersman has a wheel forward and a removable tiller aft. You can laugh at broken steering lines if you have this arrangement. The clutch control is brought up forward by the simple method of bending a few lengths of galvanized iron pipe to run through fair leads beneath the floor. Throttle and spark controls will be on the forward locker bulkhead and on the engine box.

As for sheltering, the arrangement shown in the illustrations cannot be beaten in a small boat. For three-quarters of its cockpit length the boat is covered

(Continued on page 56.)

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Building a Tunnel Stern Boat.

(Continued from page 30.)

canvas and any uneven spots or edges will show and quickly wear through. To cover the canvas use 8 to 10 oz. canvas, first give them a thick coat of paint, and then spread the canvas over the wet paint, start in the center and tack from both sides stretching the canvas as tight as possible, bring it up the sides of the coaming for about 3/4 of an inch and finish with a quarter round, bring the canvas down on the sides 1 1/4 inches and cover it with a 3/4 inch oak fender. As soon as the canvas is on give it a good coat of paint, rubbing it into the pores; this will keep out the dampness and prevent it from shrinking or wrinkling.

The sides can now be caulked, payed and puttied, and three coats of white paint given her from water-line up. The inside finish and arrangement is a matter of personal taste, either seats and lockers can be put on both sides and across the back, or a stern seat with locker, and one across the front, with room in between for chairs. For ceiling the sides and front bulkhead use 3/4 x 3 inch cypress. Chamfer the edges 1/4 inch and nail with finishing brads. The front bulkhead is made with large door almost all the way across, make it in two sections, so it will be easy to handle. The floor can be raised up above the shaft log, and is made of 3/4 inch cypress or pine, as preferred. Finish the inside and coaming natural color, and give it three coats of varnish. Make the engine bed as long as possible, and fasten it down to each bottom board with screws. The shaft log is very short, it is just a block extending out long enough to allow the stuffing box to be fastened on. Make the hole 3/4 inch larger than shaft, if no bit is handy, this block can be made by any blacksmith to pattern shown. To install it, first put in the engine shaft log and shaft in the log, so it will clear all around, then nail a slat across the tunnel on the outside just beyond where the bearing is to be, and fasten the shaft to this, be very careful to line it up straight and turn the engine over to see if it is perfectly free, then fasten the strut in place, to the sides of the tunnel with 3/4 inch bolts, leaving room all around the shaft for rabbitt. To rabbitt it, first soap the shaft and cut a piece of cardboard to stop up each end, then cover the end all over with clay, leaving a small opening on the top on each side, one to pour in the rabbitt and the other to let out the air. The irregular shape of the opening will anchor the rabbitt, or if thought necessary, a few holes can be drilled, but be sure to stop them up with clay on the outside. The rudder is 1 1/4 inch oak and has two 3/4 inch dowels driven in. Drill the holes for the dowels 1/64 inch small. The irons and gudgeons will have to be made by a blacksmith. The tiller is a 3/16 x 1 inch hand iron bent around the top of rudder and going through the transom. Put the steering wheel on one side, out of the way when working with the engine, and cross the tiller rope under back deck, and bring both ropes up on the same side.

The A. P. B. A. Plans for 1915.

(Continued from page 16)

and the rating may exceed twelve times the square root of the waterline length.

Express cruiser class shall also include those boats which would normally fall in the cruiser class except that their rating exceeds 15 V. L. W. L.

An open boat is one weighing sixty or more pounds per rated horsepower or a boat not included in any of the other classes.

In order to ascertain whether an open boat will rate as a displacement racer or not, proceed as follows:

Measure the midship section for area (MS) by the method used for Division 3 (Open Boats) and substitute this area (MS) in the following formula:

If this product (W), divided by the displacement

racer horsepower-rating (HP = $\frac{W}{\text{HP}}$) is less than

sixty (60), the boat must be weighed. If the scale weight divided by the racer horsepower rating is found to be greater than sixty (60) then the boat shall be measured and rated as an open boat; otherwise she shall be considered a displacement racer. If the product (W) Formula 1) divided by the racer horsepower rating is 60 or over, the boat need not be weighed but shall be rated and classed as an open boat.

In races, standing canopy, shelter cabin and strictly open boats may be subdivided into separate racing classes where the number of entries warrant.

A displacement racer is a boat weighing less than 60 pounds per rated horsepower when in racing trim. The racer horsepower to be used in determining this. As the methods of rating open boats and displacement racers are based on entirely different basic principles, it follows that the two types of boats should not be raced together in the same class. However, if for any reason is it thought desirable on account of local conditions to race open boats and displacement racers together, the local committee must decide whether the boats shall be rated according to the formula for open boats or that for displacement racers, but they shall see to it, that all boats are rated according to the same formula. In sanctioned races, however, the separation of the two divisions must be enforced.

A hydroplane is a racing boat whose propeller acts in or against the water, and which has one or more of the following characteristics:

(a) One or more breaks in the longitudinal continuity of the immersed surface, or an under body having more than one lifting surface.

(b) An area of immersed transom exceeding 50% of the immersed midship section area taken at 50% of the load water line. (Actual areas, with crew on board in racing positions.)

The new formula for rating displacement racers (Division 4) is rating =

$$\frac{360}{\sqrt{W}}$$

and for hydroplanes (Division 5) is, rating =

$$\frac{400}{\sqrt{W}}$$

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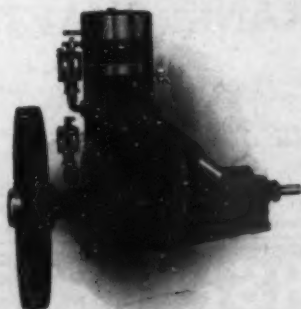
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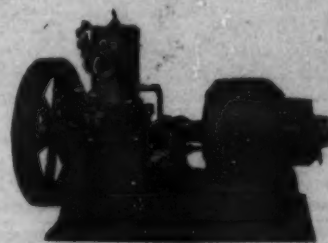


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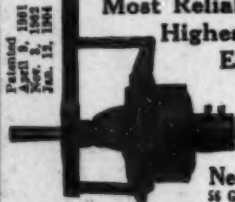
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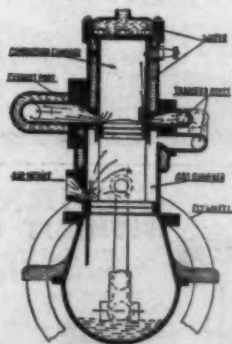
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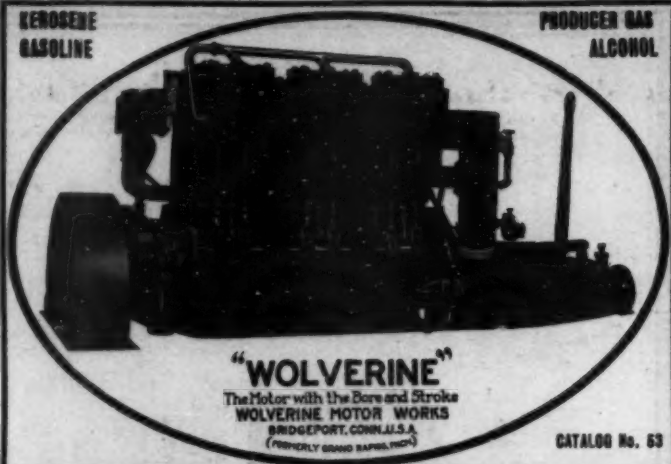
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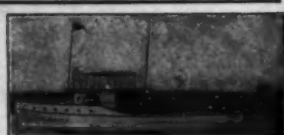
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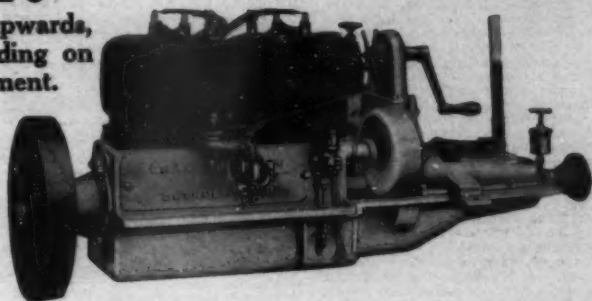
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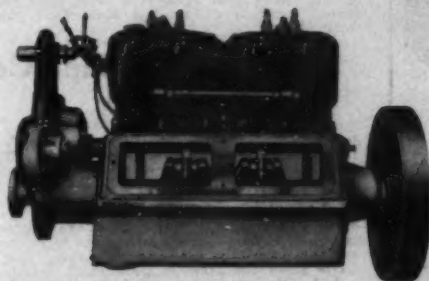
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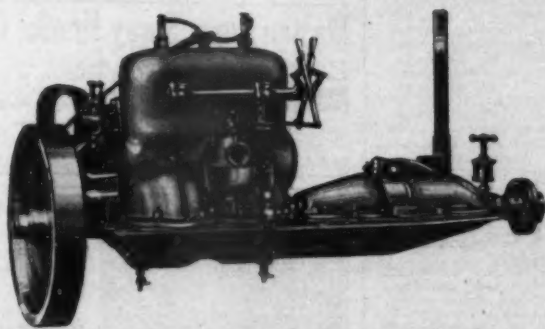
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Possibilities of the Small Boat

(Continued from page 48.)

by a navy type hood. Forward of this is a regulation fan type sprayhood that hinges to the sides of the combing and folds on to the forward deck. The navy type hood has permanent galvanized iron stanchions held at the center by a fore and aft ridge pole of the same material.

The khaki covering is fitted with light oak battens running fore and aft through pockets and fastened to the stanchions by means of brass rings. The wood is so arranged that it can be lashed to the ridge pole during daylight running. At night the sprayhood forward buttons by means of a flap to the navy hood, furnishing an absolutely watertight covering. There are two interior curtains, one hanging across the stern opening, and the other being arranged to fasten to the amidships bulkhead, giving two isolated compartments.

As for cooking arrangements, the writer plans to carry a sheet of heavy tin that can be placed on the amidships cross seat, on which an alcohol or kerosene stove can be placed. When not in use the sheet of tin can be stored under the forward starboard cushion.

As for cost, this boat should call for but little over the average price for a craft of this size. The main trouble, discovered by the writer, is to overcome a builder's prejudice against departing from conventional lines. I have had a number of amusing experiences in this line while obtaining estimates. The writer's object has been to get estimates in a hull of this type complete, except engine and clutch.

One firm that makes a business of turning out small boats containing the usual narrow, back-breaking side seats, and spray-catching launch type bows, refused to estimate on it at all. "This plan," wrote the superintendent of the yard, "contains as much detail as that of a fifty-foot cruiser." An absurd statement, yes, but excusable on the plane that it took some folks a long time to abandon the old horse and buggy for the cheaper and more efficient automobile.

Another firm had the audacity to seriously send in a bid of \$800, without, mind you, having to furnish the power plant. It was a new design, and, therefore, the prospective owner who had dared to defy conventions must be "soaked." Others, however, welcomed the opportunity afforded to turn out a sensible, comfortable small boat at a reasonable price, and bids several hundred dollars less than \$800 have been received.

Through the Cape Cod Canal

(Continued from page 13.)

dead on end for the Hen and Chicken Lightship. Then, falling into the trough, the situation developed. As Captain Roche expressed it, the combination was all that superstition could make—Friday, the 13th.

But the life boat demonstrated her ability, taking the vicious combers like a duck. The spray was driven in sheets, drenching those in the standing room, and she rolled, too, a foible that has to be excused in any vessel with the wind and sea abeam. The wireless masts stood the crew in good stead, being securely lashed. No matter how hard the boat rolled, these masts were rails, so the crew let her take the medicine with assurance that S. O. S. could never get bottom up, owing to her model and scientific distribution of weights. Once, when they were watching the shore, a sea swept over the standing room, but the self-bailing cockpit drained immediately, only temporarily disturbing the boat's trim. Not once was she lousy during assault by riotous seas. Captain Roche says he gloried in the combat because he knew the boat would live under any conditions likely to be encountered.

An ocean tug poked out from Newport and, after getting a look at the weather, ran back rather than buck it. S. O. S., as was learned later, had come through a gale where the wind registered a velocity of 64 miles an hour. Something of a blow for so small a boat, but no damage was sustained except to crockery. The motor, a 25 h.p. Holmes, came through the ordeal without a miss, and the propeller, turning nominally at 450 r.p.m., showed no tendency to race excessively, even when the boat was balancing on the backs of the high ones. No water seeped into the cabin, thanks to the clamping devices on the doors, and the motor department kept dry—remaining closed till the boat had entered Newport Harbor, where anchor was dropped at 3:30.

That night it continued to blow hard, and Newport was a city of whistling blasts. S. O. S. had been anchored near the electric light station in two fathoms and was bridled, at that. Almost as soon as the tender had been put over it blew full of water—so Captain Roche affirms, and I have no reason to doubt him. The crew went below, touched up the alcohol stoves and dried out while a dinner was in the making, the first meal since morning. Storm signals were flying, and it was necessary to be up and down all night to see how the boat was doing.

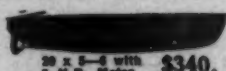
The wind swung into northwest during the night and it became uncomfortably cold. Next morning, at 8 o'clock, the boat started out and found a big swell running. Rounded Point Judith at 10 o'clock and passed Watch Hill light at 1:35. Ram Island Lightship was abeam at 2:05. From this point to West Mystic was an easy run, the boat tying up at the wharf of the Holmes Motor Company at 2:30 o'clock.

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ORIGINAL
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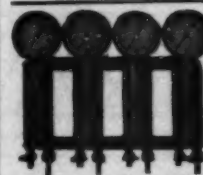
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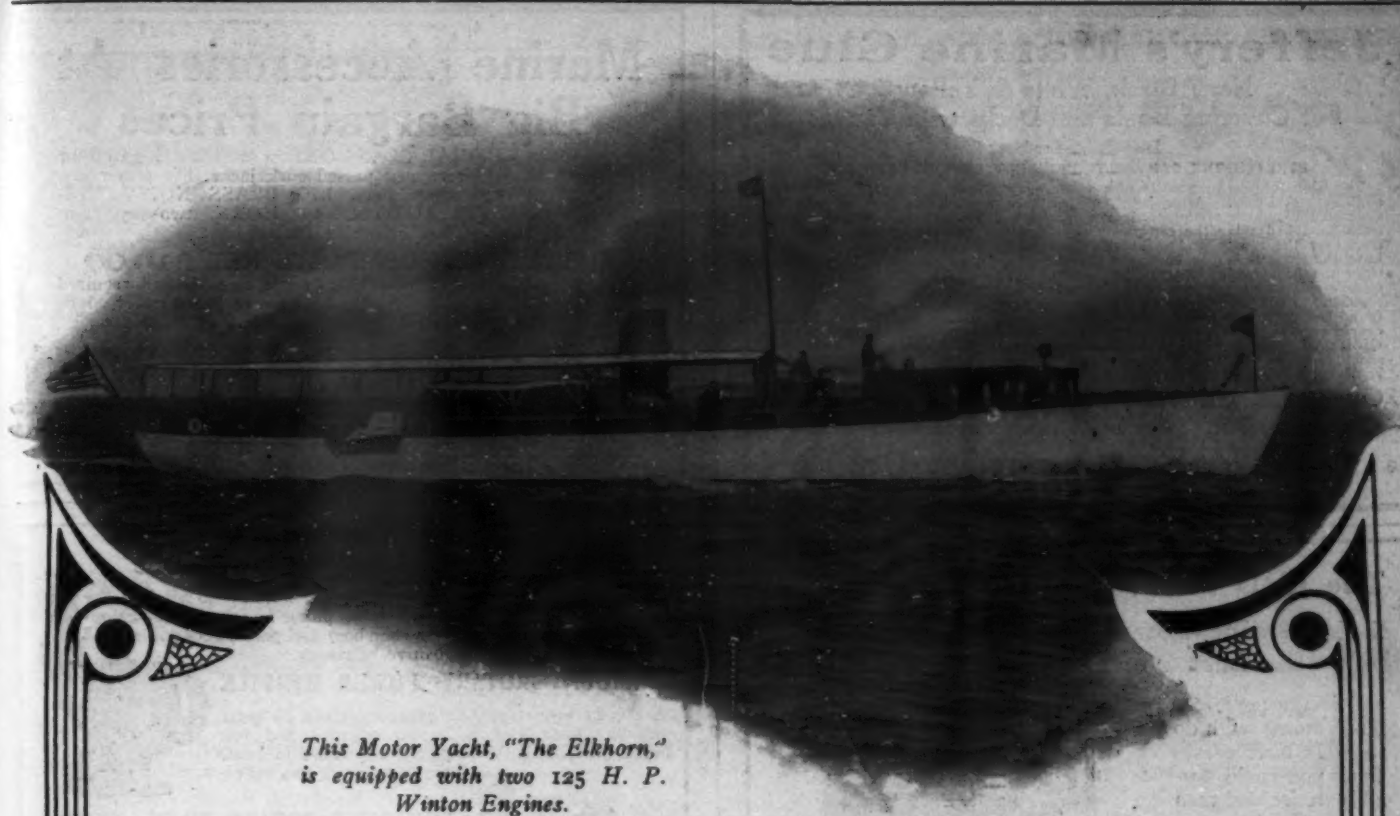
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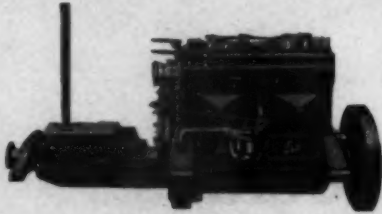
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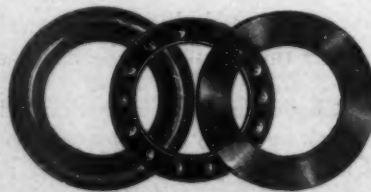
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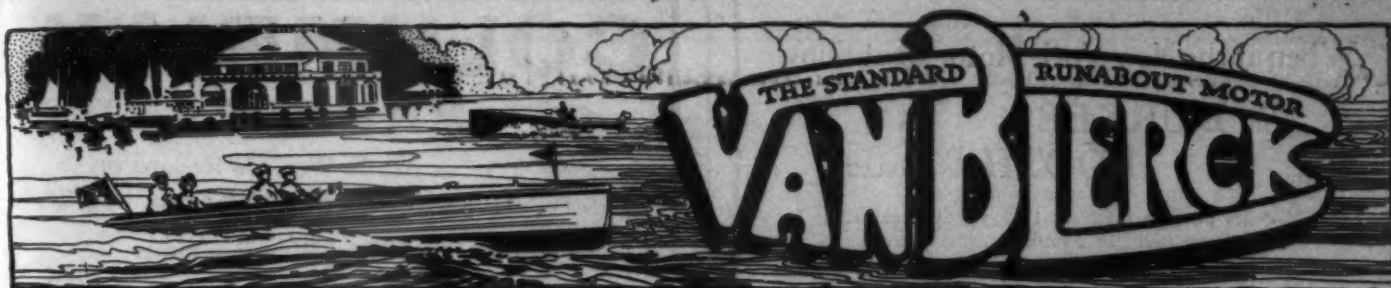
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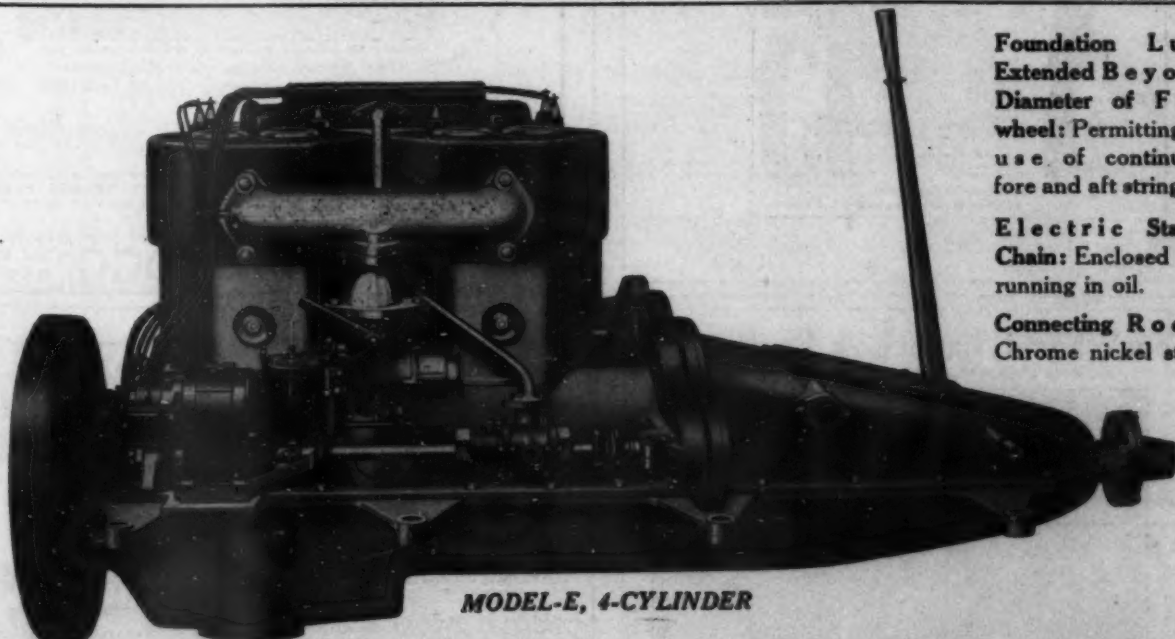
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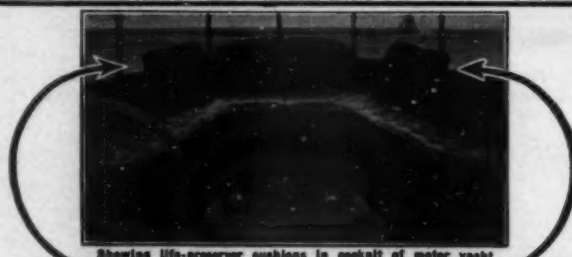
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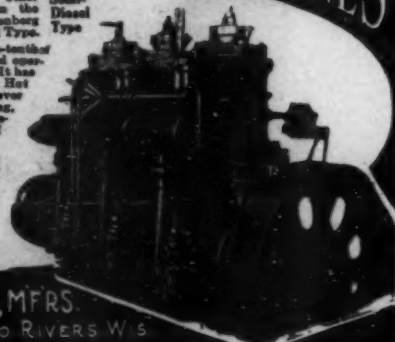
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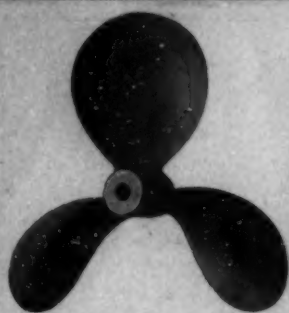
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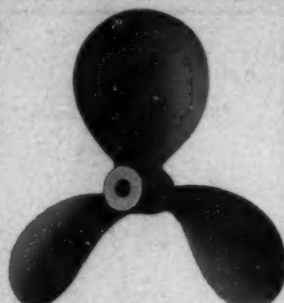
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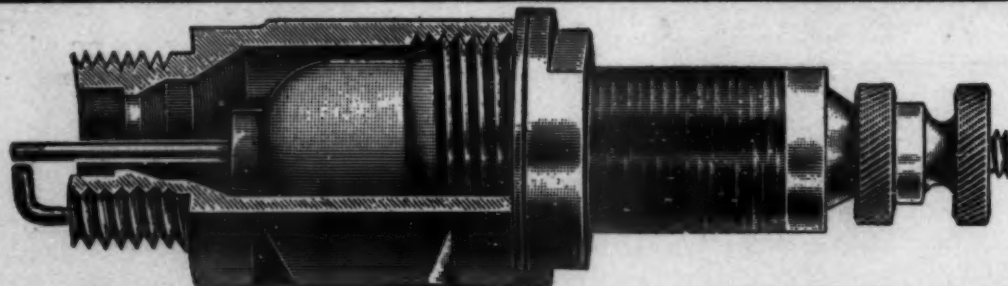


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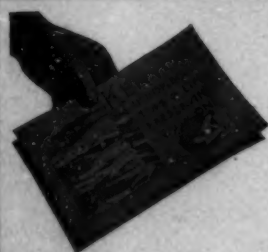


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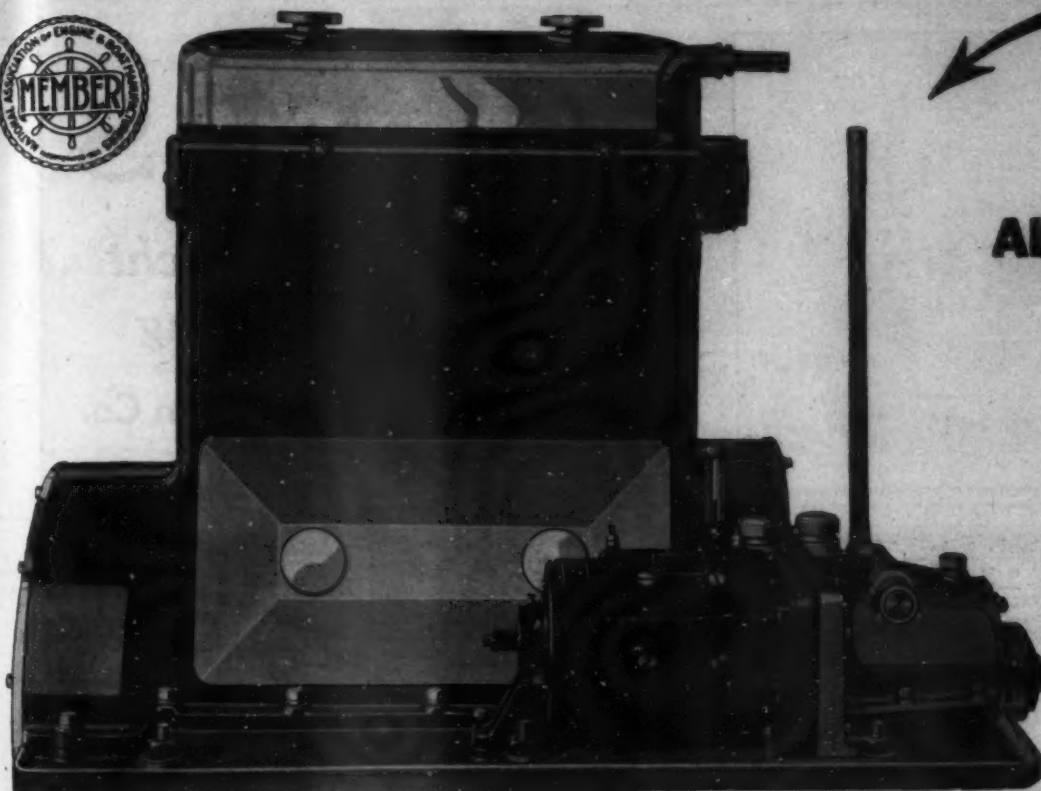
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MICHIGAN STEEL BOAT COMPANY, 1236 Jefferson Avenue, Detroit, Michigan, U. S. A.

(162)



Aragon, 46 x 11 ft. Cruiser. Owner, Dr. A. B. Bennett, Jr.,
Commodore of Corinthian Yacht Club, Washington, D. C.

NIAGARA BOATS SATISFY

NIAGARA MOTOR BOAT Co., North Tonawanda, N. Y.

Washington, D. C., July 30, 1914.

Gentlemen: I have just reached home after a very successful trip of two and one-half weeks. You will doubtless agree that a new motor boat to make a maiden trip of over one thousand miles in strange hands and through strange waters with a perfect score is worth remarking upon. The power and electric plant gave no trouble whatever, and the boat behaved perfectly in all kinds of weather.

Everyone who comes aboard the Aragon agrees that she is the roomiest boat of her size they have ever seen.

With best wishes always, I am

Sincerely yours,

DR. A. B. BENNETT, JR.,
Commodore of Corinthian Yacht Club.

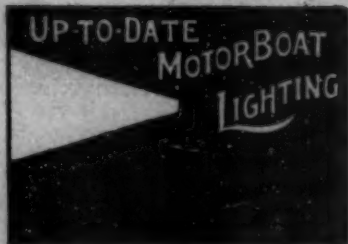
We can build you a cruiser, runabout or speed boat that will satisfy you in every particular.

Write for information and literature advising size and type of boat you are interested in.

NIAGARA MOTOR BOAT COMPANY

210 Sweeney Street
NORTH TONAWANDA, N. Y.

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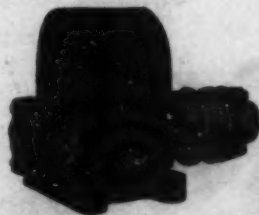


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We are pioneers in the low tension, direct current magneto line. Sixteen years of experience is built into the COMET MAGNETO for stationary and marine engines. This same experience has enabled us to produce the EUREKA LIGHTING OUTFIT, a simple, low-priced lighting outfit for motor boats and automobiles. When you want the best in any line, you go to the experienced expert. We are the experienced expert in magnetos and lighting outfits.

Full particulars will be found in our catalog, which will be sent on request.



Eureka Jr., B C 3 with Automatic
Cut Out. Size, 3 1/2 x 4 x 6 inches
Ball Bearings Throughout.

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"The Engine That Makes Good"

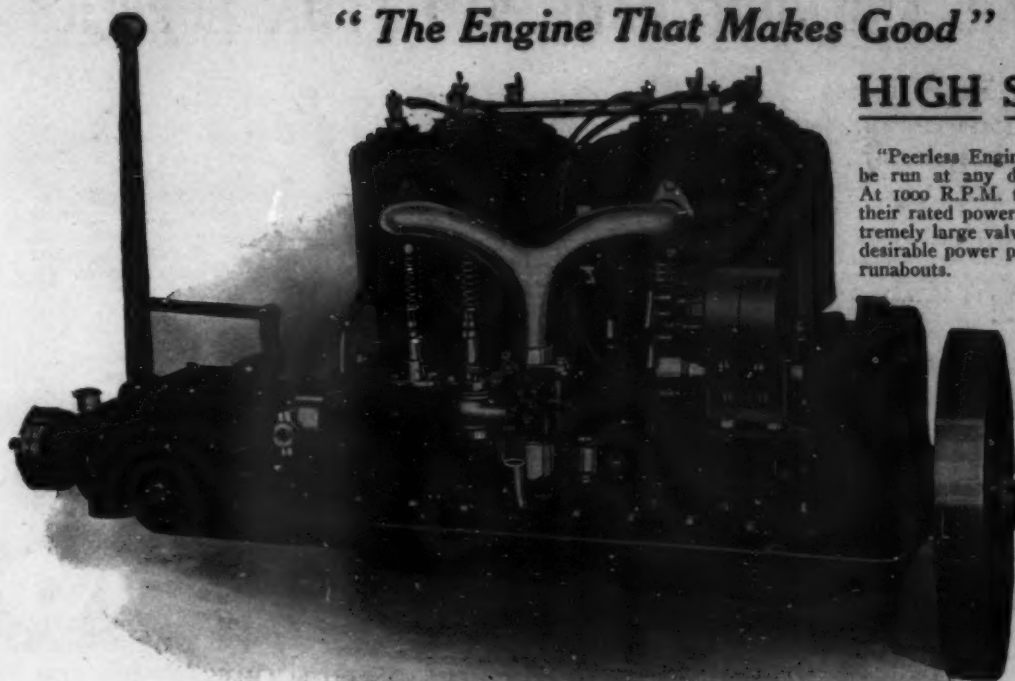
HIGH SPEED

"Peerless Engines" are so designed that they can be run at any desired speed up to 1200 R.P.M. At 1000 R.P.M. they will develop 25% more than their rated power. The "T" head design, with extremely large valves, makes the "Peerless" the most desirable power plant for either speed boats or fast runabouts.

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Any of the Peerless Engines make an ideal power plant for medium duty service, they have the necessary bore and stroke to develop their rated power at a speed suitable for cruiser work. They are also very quiet and smooth in operation, flexible in speed control and economical in fuel consumption.

All engine equipment is included in the Peerless prices—Kingston Dual magneto, Model "L" Schebler carburetor, Detroit force feed oiler, spark plugs, priming cups, all necessary wiring, etc.—in fact the engine is complete in every respect and ready to run.



Port Side (1915 Model)
4 Cylinder "Peerless"

PRICES, FOUR-CYLINDER ENGINES

16-20 H.P.	Bore 4",	Stroke 6",	complete with gear—	\$360
25-35 H.P.	" 5",	" 6",	" " " "	\$450
40-50 H.P. (Medium Duty)	" 5 1/2",	" 7",	" " " "	\$600

WHAT PEERLESS USERS SAY:

Tufts College, Mass., September 21, 1914.
PEERLESS MARINE MOTOR CO.,
Buffalo, N. Y.

Gentlemen:

Enclosed you will find a small photograph of my 22' motor boat, in which there is installed one of your 16-20 H. P. Peerless engines.

The engine had been installed only two days when I started from New Bedford to Boston around Cape Cod, the canal not having been open at that time. I reached Boston safely and about a week later continued the trip to the Maine coast beyond Portland, reaching the latter destination after a rather rough trip, but safe and sound.

Since July 1st I have run the boat about 1200 miles and have had no engine trouble whatever. The boat has proved to be a beautiful running boat and the engine a model of steadiness, reliability and power.

I shall be very glad to recommend your engine to anyone who may inquire about it.

Yours very truly,

EDWARD H. ROCKWELL.

Tufts College, P. O., Massachusetts.

Hamilton, Ont., December 7, 1914.
PEERLESS MARINE MOTOR CO.,
Buffalo, N. Y.

Gentlemen:

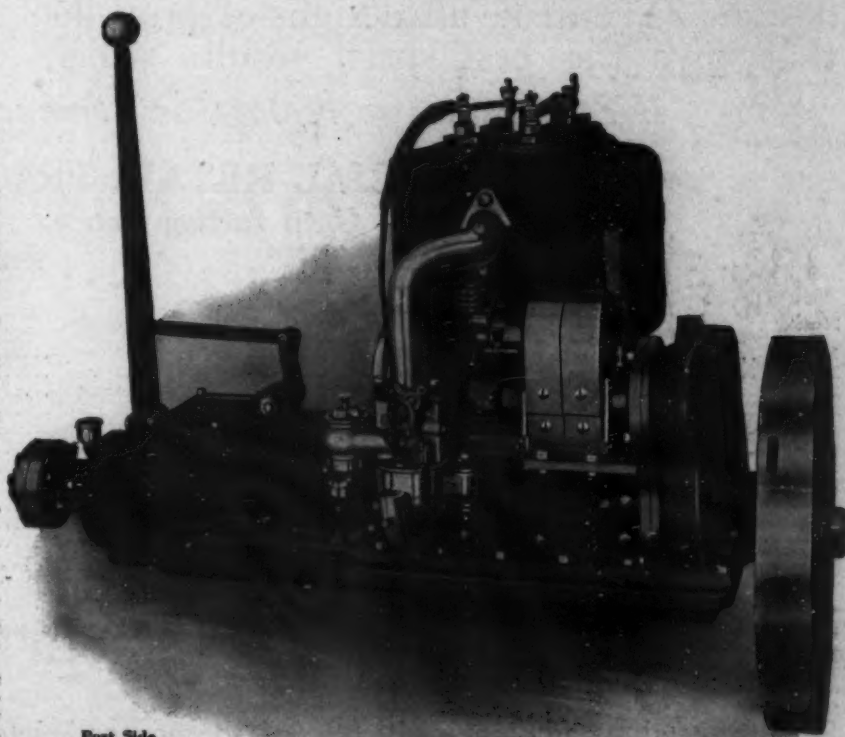
I am enclosing herewith a photograph of my boat, "Rob Rob." This boat is 45' long with a beam of 8' 6", and is equipped with a four-cylinder, 25-35 H. P. Peerless engine.

I wish to say that this engine has given entire satisfaction in every respect. The motor was installed the last week in July, and we immediately started upon a three weeks' cruise to the Thousand Islands and return. The motor did not give any trouble throughout this trip and for the balance of the season.

I consider the Peerless engine one of the most reliable marine engines on the market today.

Respectfully yours,

J. H. FERNSIDE.



Port Side
(1915 Model)
2 Cylinder
"Peerless"

PRICES, TWO-CYLINDER ENGINES

8-10 H.P.	Bore 4",	Stroke 6",	complete with gear—	\$240
12-16 H.P.	" 5",	" 6",	" " " "	\$275
20-24 H.P.	" 5 1/2",	" 7",	" " " "	\$375

PEERLESS MARINE MOTOR CO.

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No. 3.... 31.20	No. 6.... 72.00

Our No. 1 Gears are used on Kermath and many other engines up to 15 H. P.



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2-blade Propellers		3-blade Propellers	
12 inch.....	\$14.88	12 inch.....	\$20.88
14 inch.....	18.19	14 inch.....	22.32
16 inch.....	19.44	16 inch.....	27.12
18 inch.....	26.68	18 inch.....	31.20
20 inch.....	28.80	20 inch.....	37.68
22 inch.....	33.12	22 inch.....	38.88
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Ask for prices on larger sizes, also Feathering Propellers.

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No one type of propeller wheel will fit all classes of boats. Every boat presents a different problem. A light racing boat requires a high speed engine and a racing propeller. A heavy boat, slow speed engine and working propeller. The excuse for misfits of propellers lies in the fact that manufacturing lines are limited to one design. We make all designs of propellers to fit all classes of boats that give the best speed results which save time and money.

We guarantee to replace any bronze wheel broken.

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10 inch.....	1.80	2.25	.75	1.20
11 inch.....	2.10	2.60	.88	1.39
12 inch.....	2.28	2.79	.95	1.46
13 inch.....	2.70	3.20	1.08	1.59
14 inch.....	2.88	3.39	1.20	1.70
16 inch.....	3.90	4.50	1.63	2.23
18 inch.....	4.95	5.60	2.08	3.74
20 inch.....	6.60	7.38	2.75	3.53
22 inch.....	8.10	9.00	3.38	4.28
24 inch.....	9.60	10.62	4.00	5.02
26 inch.....	12.00	13.35	5.00	6.35
28 inch.....	15.00	16.50	6.25	7.75
30 inch.....	19.80	21.45	8.25	9.90

THREE BLADE PROPELLERS

Right and Left Hand.

Diameter.	Polished Bronze		Gray Iron	
	Net Price Unbored.	Net Price Bored.	Net Price Unbored.	Net Price Bored.
10 inch.....	\$2.10	\$2.55	\$.88	\$1.33
12 inch.....	3.30	3.80	1.38	1.89
14 inch.....	4.20	4.70	1.75	2.26
16 inch.....	5.70	6.30	2.38	2.98
18 inch.....	6.90	7.56	2.88	3.54
20 inch.....	9.00	9.78	3.75	4.53
22 inch.....	10.80	11.70	4.50	5.40
24 inch.....	13.80	14.82	5.75	6.77
26 inch.....	16.80	18.15	7.00	8.35
28 inch.....	20.40	21.90	8.50	10.00
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2½ H. P. Row-Boat Motor, special price Battery Equipment \$45.00. Magneto Equipment \$55.00.

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Yes, we realize that a Paragon Reverse Gear costs more—at first. Just as a good watch does. It has to. We've built more value *in* so you can get more service *out*. But after you've bought it you can almost forget it.

Every Paragon Gear has ample strength to carry in excess of its rated load, with a further reserve of strength to withstand severe overload. It is as light a mechanism, and as compact as a first-class reverse can properly be made.

LOOK AT THE WORKS OF THE REVERSE GEAR

on the engine you propose to buy. Examine the bushings for their wearing ability—see if the friction plates are ground to really grip—find out how much real *value* has been built in the gear.

Paragon Gears are built to last. Every single part is built a little better than seems necessary. Cast bronze bushings, for example—heavy and thick enough to stand up for years. Friction plates ground smooth as glass—that grip to *hold*.

Nearly All the Best Engine Makers Use Paragon Gears

as regular equipment. They know us as Reverse Gear Specialists, and as we produce gears in large quantities for a large number of engine manufacturers, it is only natural that we can produce a better gear for the money than a smaller manufacturer, or an engine builder who tries to make his own gears.

It's money in your pocket to buy an engine equipped with a Paragon Gear. It's one way you can judge the real service of an engine. There's a Paragon designed especially for every power, type and size of boat.

Send Now for the Paragon Booklet

EVANS STAMPING & PLATING CO.,
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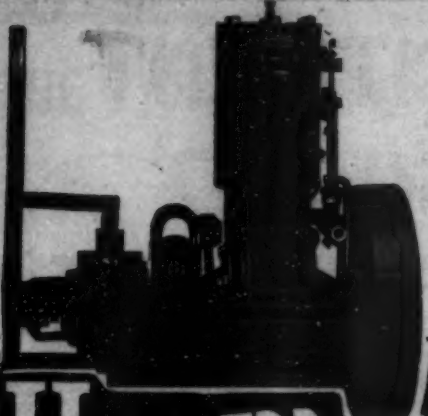
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If your service demands require utmost reliability in your power plant, you will never regret buying a Hubbard. Look up the Hubbard reputation before you buy any engine.

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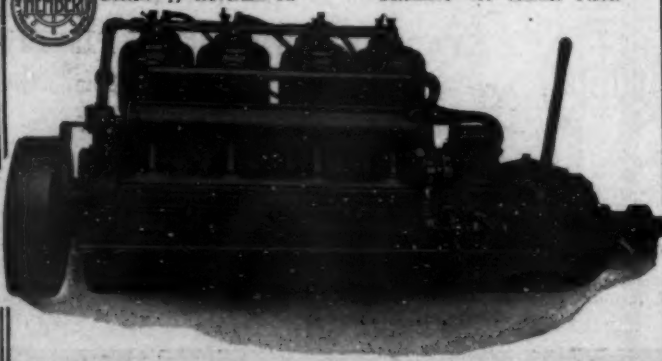
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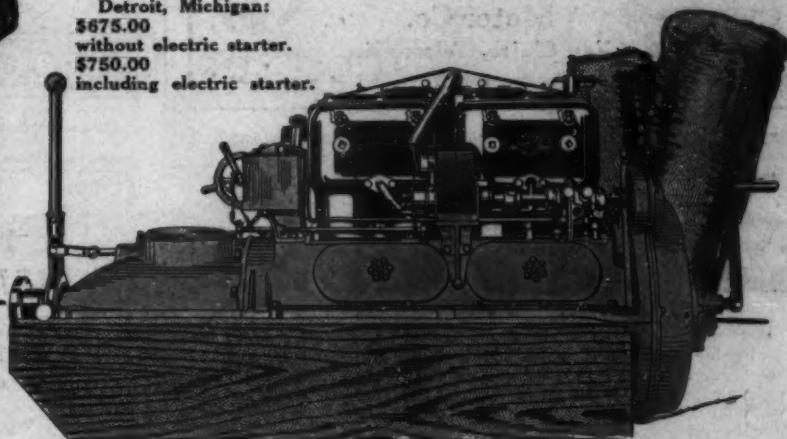
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The ENCLOSED

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PRICE—Net F. O. B.
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without electric starter.
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including electric starter.



Specifically you must look for such features as:

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631 Lincoln Avenue,

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18 H.P.

\$250

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 2 " Single Cyl. 50
 4 " " " 75
 7 " " " 100

10 H.P.
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Compact, Long Service, High Duty Engines

The most powerful, compact and reliable engines for their size in existence. Not in class with the flimsy built high speed engines that are over-rated in horsepower and with innumerable springs, cams, gears and parts to rattle loose and give trouble, but heavy service, high duty engines of medium weight and extreme compactness. Highest grade float feed carburetors, flange couplings, electric circuit break reverse levers, plunger pump brass fittings throughout, Northwestern spark and waterproof commutators without beveled gears or complicated timing devices. Northwestern Row Boat Motor is made of highest grade semi-steel and malleable iron. All parts below water are bronze except cut gears which revolve in oil, aluminum exhaust pipe, nickel-plated flywheel, rubber-covered spark plug, under-water exhaust or muffler at the option of buyer, water-cooled cylinder, battery ignition or Bosch magneto, and strictly high grade in every particular. All engines sold on thirty days' free trial.

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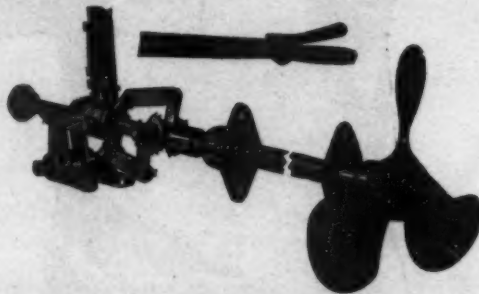
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Frisbie Motors are the highest exponents of a certain type of construction which is acknowledged by all real experts to give greater power and speed in relation to size of cylinders and amount of fuel consumed than any other construction. We refer to the valve-in-hand design, the valves opening directly into the explosion chamber or dome, without pockets or recesses to waste gas and power. Every ounce of energy from the burning gas is exerted directly upon the piston heads.

The valves are exceptionally large, insuring a full charge on the intake and a quick, thorough scavenging on the exhaust. Valves are quickly removed with their cages for grinding.

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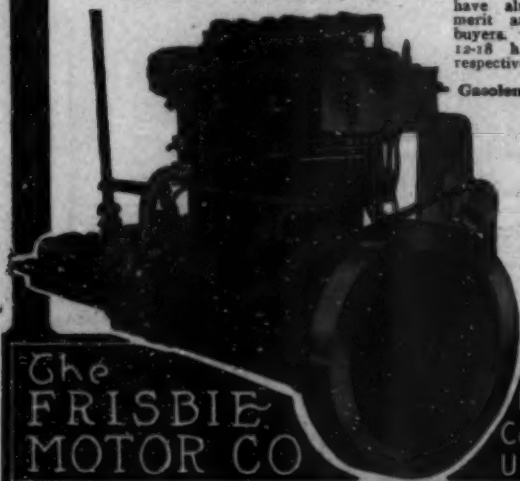
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**The
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**Means quick unfailing starts of the
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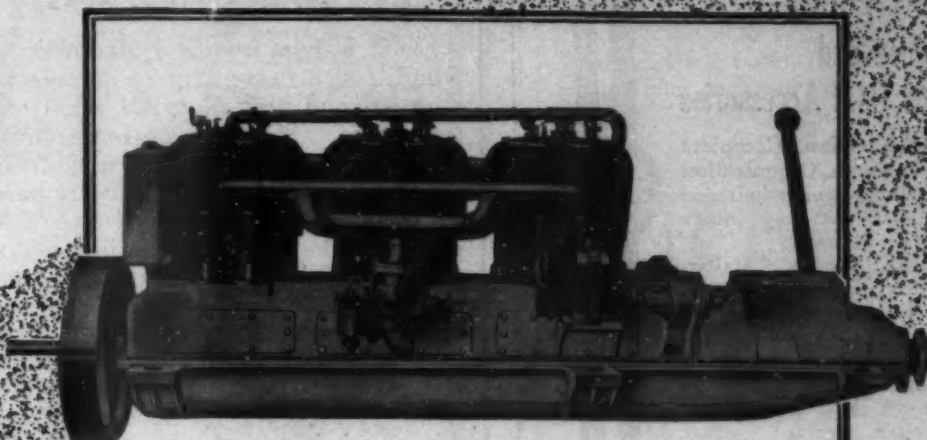
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is thoroughly efficient, safe and economical under all marine conditions—the only satisfactory system for boats.

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THERE are lots of marine motors—of all qualities, types and prices. There are lots of good ones, too, of that medium degree of merit which makes it hard to choose between them. But when it comes to the very high grade class, of which the Wisconsin is at the head, selection by the careful buyer is easy because there are few that need be considered.

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Wisconsin Motors are equalled by few and surpassed by none, in reputation and efficiency. They have proved their merit in racing and in general service so conclusively that there is no question about their ability to perform any kind of service that is required from a marine motor.

Wisconsin Motors have made history from the very first year they were produced. They have won more big events in automobile racing than any other one motor made in America. In motor boat racing they have established a record of consistent and continued success. Many of the most prominent race winners and record breakers of the year and for several years past, including both motor boats and motor cars, have been powered by Wisconsin Motors.

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5 1/10 x 5 3/4 in. 4 cyl. racing
5 2/10 x 7 in. 4 cyl. racing
4 1/4 x 5 in. 6 cyl.

5 1/4 x 7 in. 6 cyl.
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WISCONSIN MOTOR MFG. CO.

Milwaukee, Wis. U. S. A.

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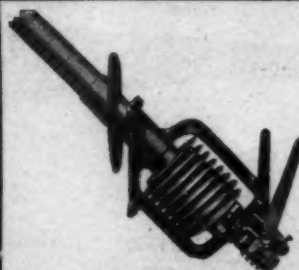
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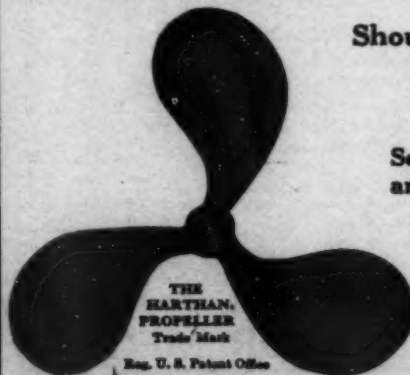


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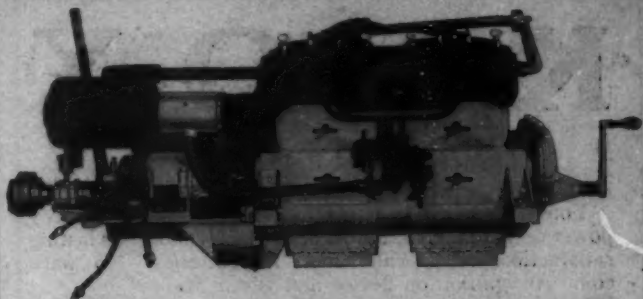


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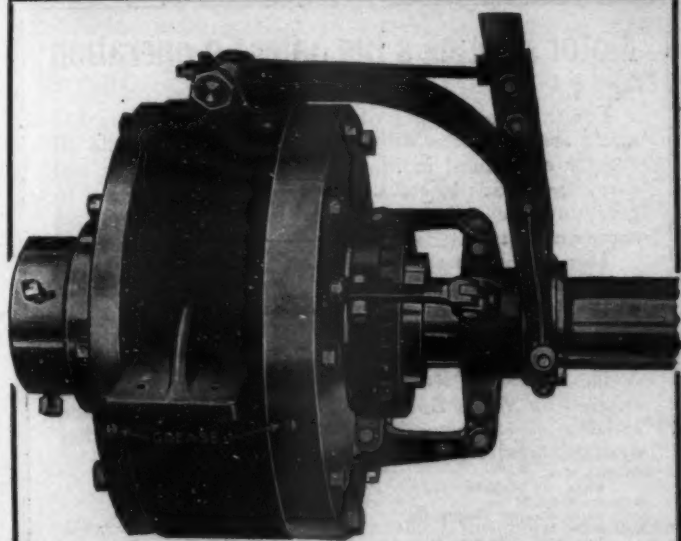
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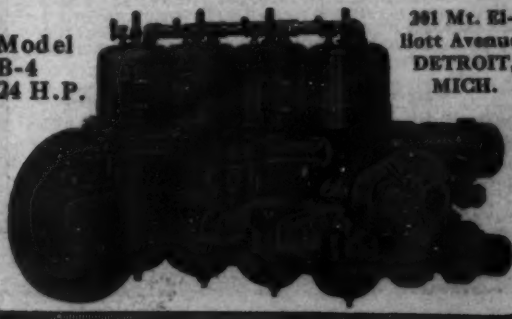
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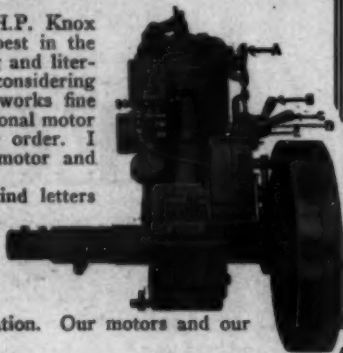
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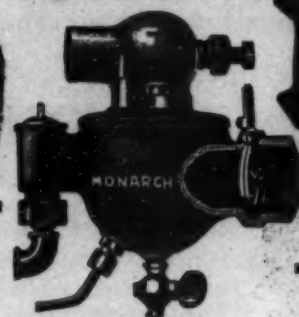
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Always the *right* amount of oil at the *exact* spot

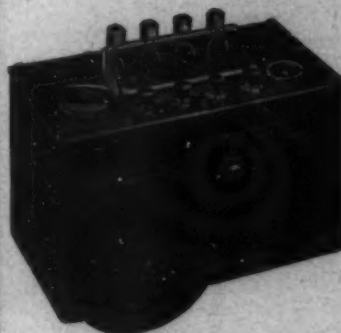
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"CYCLONE SPEED" MOTORS

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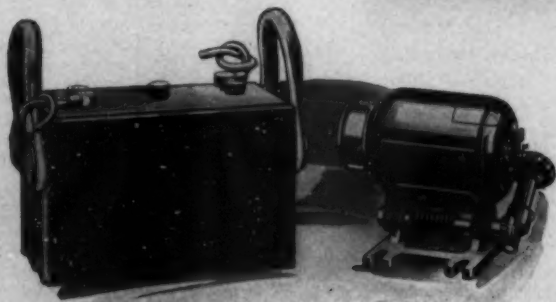
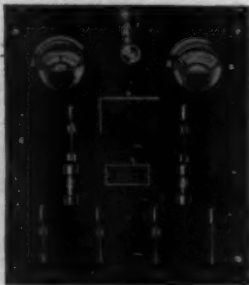
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COMMON SENSE

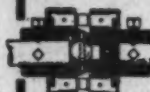
Special need of flexibility in all Motor Boats

In the very nature of things, a motor boat does not provide a substantial foundation for an engine. The engine or reverse-gear shaft and propeller shaft are therefore seldom in line. Francke Flexible Couplings make shafts that are out of line run just as well as shafts that are in line. Requiring no thrust bearings to protect them, they save the cost of a thrust bearing; they save the expense of accurate alignment of shafts; they save the trouble caused by shafts getting out of line; they save gasolene. They make the boat go faster.

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Install It Just Like a Rigid Coupling



Saves Realigning the Engine

When the engine turns over easily with the boat ashore and hard after the boat is put in the water, a slight distortion of the hull is the cause and a realignment of the shaft is the remedy, but the cure is not permanent, for the distortion comes back when the boat is running and keeps increasing the faster she runs. This distortion is the cause of slower speed, hot engine and reverse gear bearings and leaky stuffing boxes, and the only permanent cure is a flexible coupling.

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From Any Dealer, Engine or Boat Builder or

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Built His Own Boat

Just as You Can Build Yours

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Mr. J. P. Brittan, of Grenfell, Sask., owner of the boat illustrated here, writes: "Before I started your system I could not saw a straight line." Now he has the fastest boat on the lake. You can do as well. Build a Brooks Boat and enjoy the charms of Boating. Let us tell you how.

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Simplifies Boat Building and Saves 2-3 in price.

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It shows beautiful cruisers, "V" bottom models, launches, sailboats, rowboats, canoes, etc., that you can build.

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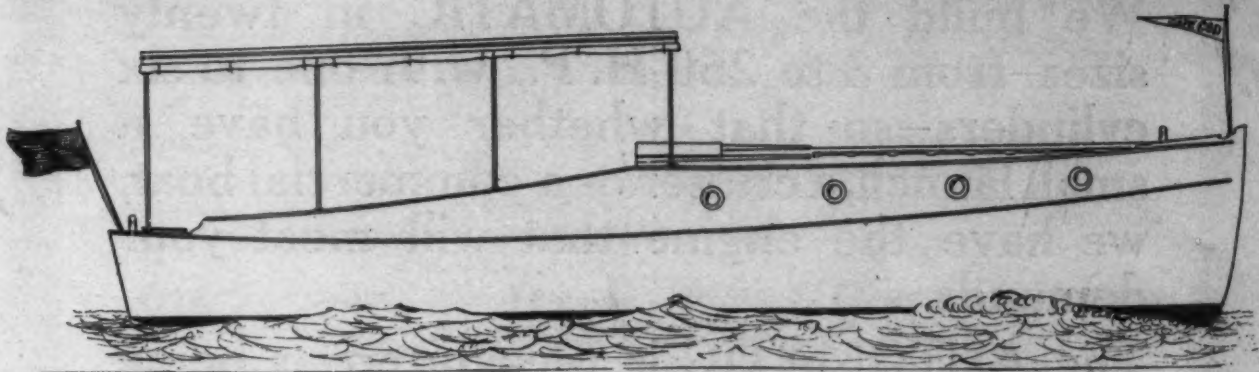
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28 ft. Cabin Cruiser will build to order 35 ft. with toilet, sink, oil stove, ice box, running fresh water, tool, dish and clothes locker, sleeping accommodations, large cockpit.



Our Leader 20 ft. Special. The safest little family boat built, will stand the ocean waters. Motor housed in. Prompt shipment. Folder No. 105.



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Rowing skiffs 10, 12, 14 ft. in stock. This for outboard motor. Can furnish Wisconsin or Maryland motor for this boat. Folder No. 103.

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100 CENTS' WORTH OF BOAT FOR EVERY DOLLAR INVESTED. No patterns or knock-down frames.

Two packages of the same size may be of vastly different values; one may contain ashes, the other diamonds. Because two engines are of the same cubic piston displacement and rated (?) horse power is no proof but that one may actually develop twice as much as the other.

Pierce-Budd Engines Lead the World in giving Actual Results in Efficiency, Reliability, Service and Satisfaction in both Heavy and Light Hulls. The above Claims are Backed by Facts

We will cite you to a few FACTS below.
In 1909 "MASCOT," a 22' x 4' boat equipped with a 6-cylinder, 4 x 4 PIERCE-BUDD engine, made the remarkable speed of 33.47 miles per hour. This boat was DECIDEDLY the FASTEST boat in PEORIA, ILL., races in

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In 1911 and 1912 Mr. S. A. Smeyers' boat, "CAROLINE E." equipped with a 3-cylinder, 4 x 4 PIERCE-BUDD engine, was credited with the remarkable speed of 30 miles per hour in the races held under the auspices of the Akron Yacht Club, Akron, O., beating boats of THREE and FOUR times his RATED HORSE-POWER.

In 1913 "SCAT," a Mullins' steel hydroplane equipped with a 3-cylinder, 18-25 H.P. PIERCE-BUDD engine, won FIRST PRIZE in the races at Alexandria Bay, N. Y.; INTERSTATE CHAMPIONSHIP at Toledo, O., but afterwards disqualified for not rounding the proper buoy on upper turn in first round (5 rounds, 30 miles), although she beat the second boat by 11 minutes; FIRST PRIZE small hydroplane class at Motor Island, Buffalo, N. Y., \$300.00 and Sterling Silver Trophy; SECOND PRIZE in free-for-all, same place, making 30 miles in 1 hour 4 minutes and 11 seconds, including 11 turns. In all of the above races the PIERCE-BUDD engines were of MUCH LESS cubic contents of piston displacement than ANY OF THEIR COMPETITORS.

In 1914 the "UGLY DUCKLING II," owned by Mr. Harry Godley, Davenport, Ia., although having the smallest cubic piston displacement, beat 11 boats out of 17 boats entered in the races at Peoria, Ill., July 2-3-4.

What They Are Doing in Heavy or Large Boats

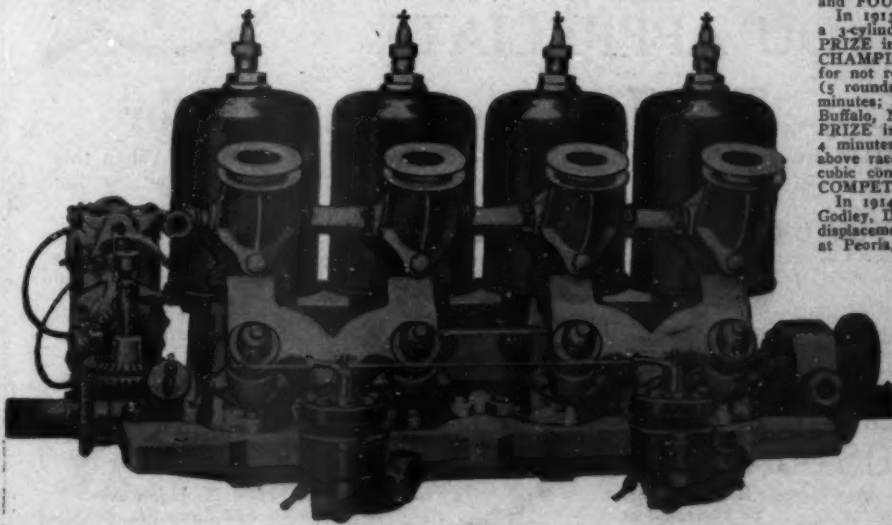
Boat owned by Mr. H. H. Loring, Smiths Falls, Ont., 25' x 10' MAKES 15 1/2 MILES PER HOUR with a 3-cylinder PIERCE-BUDD engine of 47" bore and 4" stroke, rated 13-15 H. P.

Mr. Joseph LeChance, of St. John's, P. Q., has a single-cylinder 4 x 4 PIERCE-BUDD engine installed in a 25' boat and makes 12 miles per hour. He turns a 2-blade, 16" diameter, 14" pitch propeller.

Mr. F. H. McKay, of Newburyport, Mass., has a 3-cylinder 18-25 H. P. PIERCE-BUDD engine installed in a HEAVY SERVICE BOAT 25' x 8' 6" and makes 12 M. P. H. with five people aboard over a 100-MILE RUN and uses ONLY 17 pps. OF GASOLINE PER HOUR.

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Pierce-Budd Co., Bay City, Mich.



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The Automatic Machine Co.
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KINGSTON

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IF YOU APPRECIATE

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Half the satisfaction of owning a motor is in keeping it up to the highest possible point of efficiency. When this efficiency also means important economy the man who neglects it pays more to run his boat, and gets less satisfaction for his money.

WE WILL LET YOU USE A KINGSTON FOR 30 DAYS FREE

We are so sure that a Kingston Carburetor will increase the efficiency of your engine and the speed of your boat that we will let you use one on your boat for Thirty Days, until you decide whether you want to keep it or return it. It doesn't cost you a cent to find out and you are the sole judge.

The Kingston Carburetor adjusts itself automatically to every change of weather, atmosphere or temperature, without attention from the operator. For this reason it is ideal for marine use. There are no springs or other parts to wear. Only one adjustment—the gasoline needle valve, which any novice can set correctly in a few seconds.

Our model "Y" was designed especially for the present low grade gasoline. It gives more power, better economy, easy starting, great flexibility and more speed than any other carburetor. A trial on your own boat will prove it.

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Boston Office,
99 Haverhill St.

Chicago Office, 1436 Michigan Ave.
Los Angeles, 332 Picco St.

POWER

When you buy a motor, if you buy it right, you don't buy just so many cylinders of such and such a size, or so many wheels and gears—you buy, or at least *should* buy—a given quantity of *power* to be delivered in full quantity, day after day, for many years. Power—*excess* power—*more power* than the buyer pays for—is the secret of Doman supremacy among motors wherever power driven craft are used on salt seas or inland waters.

Doman Motors are Shipped Complete

all ready to install—no extras to buy.
Salt water equipment furnished if desired.



Doman Equipment is the Best

the market affords. Paragon Reverse Gear, Schebler Carburetor, Bosch Magneto, Detroit Force Feed Lubricator.

Free "Insurance" For You

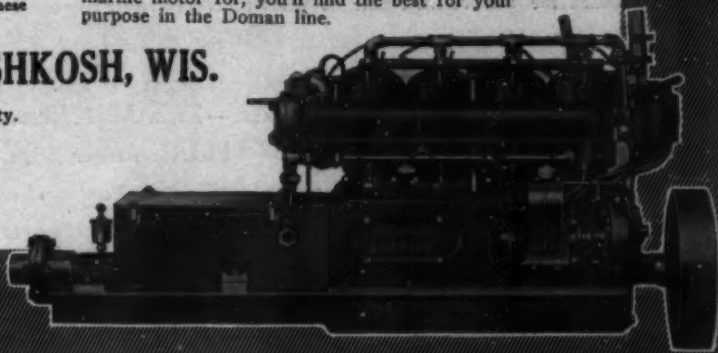
The best "insurance" you can get against making an unwise motor purchase is to send for the Doman Catalog and Owner's Book and read the indisputable evidence that the Doman gives you most power, most service, most satisfaction for your money. Hold your motor order until you can read and study these two valuable books. Shall we send them to you—free?

The RIGHT Motor for Every Need

Doman Motors are built in Medium Duty, Heavy Duty, and High Speed types—all sizes from 2 cyl. 6 h.p. to 6 cyl. 60 h.p. No matter what service you need a marine motor for, you'll find the best for your purpose in the Doman line.

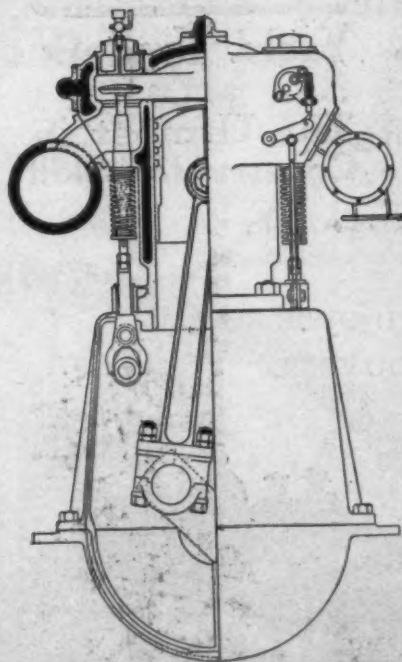
The H. C. DOMAN CO., Dept. C OSHKOSH, WIS.

G. H. SCANLON, 202 Fulton Street, New York City.
S. V. B. MILLER, Seattle, Wash.
HENRY C. HYDE, San Francisco, Cal.
GIBBS GAS ENGINE CO., Jacksonville, Fla.
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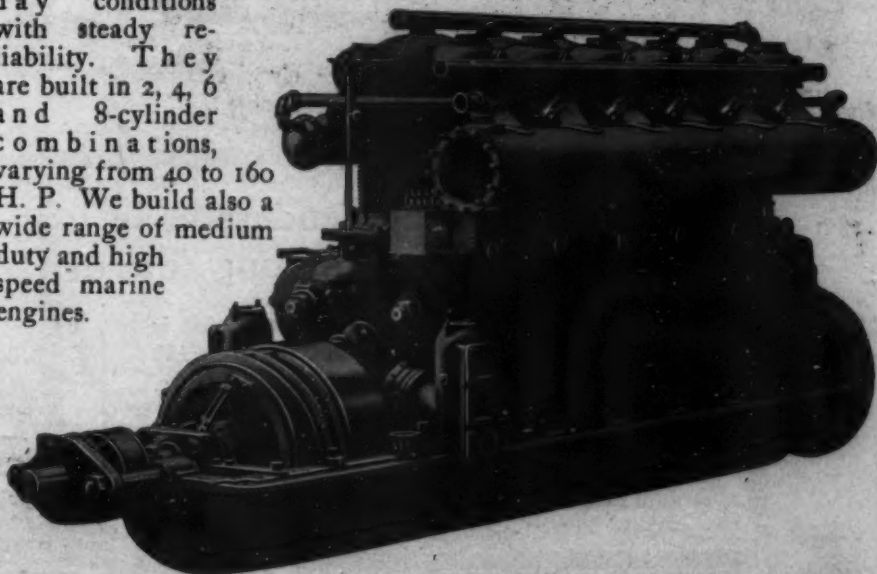


Mason JAGER ENGINES

7 to 160 H. P.

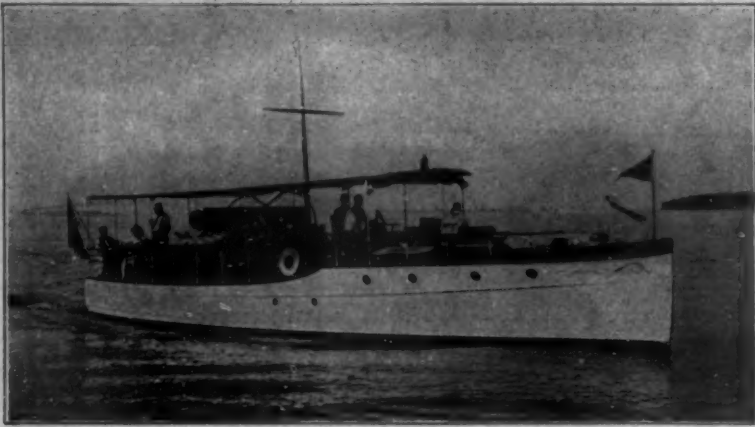


Our Heavy Duty Type N Engines are not only good to look at, but they bear the closest inspection with satisfaction to the customer. They look good also after years of service, because they meet every-day conditions with steady reliability. They are built in 2, 4, 6 and 8-cylinder combinations, varying from 40 to 160 H. P. We build also a wide range of medium duty and high speed marine engines.



JAGER ENGINE CO. 1315 Custom House Street **Boston, Mass.**

MATTHEWS CRAFT



50-ft. Cruiser *TRAVELER*, Exhibited Madison Square Garden 1914.

Owned by a retired ranchman from Montana. This is the finest 50-footer yet built. The *TRAVELER* is added to the list of Matthews' Successes

Yacht "Traveler" Enroute

The Matthews Boat Co.,
Port Clinton, Ohio.

Gentlemen:

Well, here I am, after a two months' cruise on the Great Lakes, embarked for my long trip to Cuba and Panama on board the yacht *TRAVELER*, and thinking that you would like to hear from me—here goes!

As regards the boat in general, there really isn't anything else to say excepting that she has proven to be really superb, and in several little spells of Lake Erie weather, has proven her general design and workmanship, and while it is true that I am a Simon Pure amateur and know more about western ranges than I do boats, I have come to the conclusion that handling a Matthews Craft is much easier than branding a yearling heifer.

I do not wonder that the boat attracted so much attention when exhibited by you in New York City at the show last winter, as my many visitors aboard the *TRAVELER* take no pains to conceal their expressions of admiration in the all-around construction and equipment of the boat.

JDM-ESH.

Yours very truly,

(Signed) J. D. MEYERS.

Write for Bulletin--The Matthews

Electric Power Capstan. Electric Power Bilge Pump.

Electric Power Air Pump. Electric Power Gasoline Pump.

Electric Power Tender Hoist. Exhaust Hot Water Heaters for Motor Boats.

The Matthews Boat Co. Port Clinton, Ohio

Builders of the World's Finest Cruisers



Speedway Yacht Tenders

The Utmost in
Constructive Skill

Speedway Yacht Tenders have long enjoyed the preference among careful buyers.

Two types are shown here: a 21 ft. tender that is proving increasingly popular for yachts up to 150 feet, and a 35 ft. model for yachts of 200 ft and over.

Whatever your requirements, from the Speedway line you are always able to make a desirable selection. Remember, too, that a Speedway owner invariably belongs with the satisfied kind.



Gas Engine & Power Company and
Charles L. Seabury & Company, Consolidated.
Dept A, Morris Heights, New York City.



THE "Small Aristocrat"

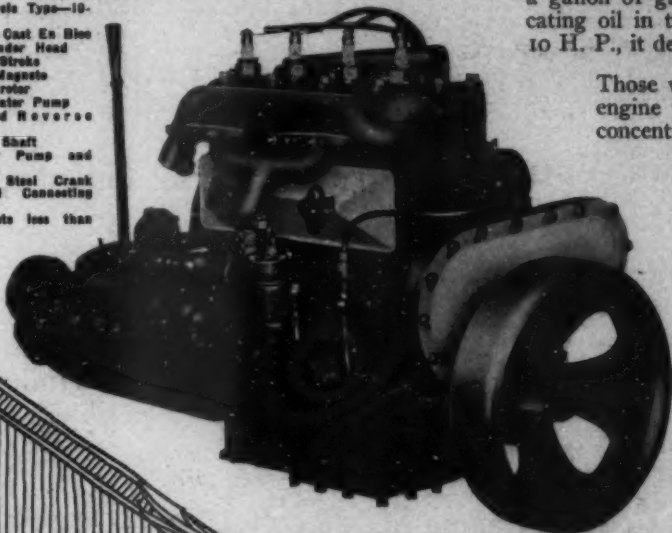
The Highest Grade Small Marine Motor That Can Be Built

The "Small Aristocrat" supplies in a small motor for small boats the same quality of design, construction and finish which you find in only the finest and most expensive big motors. We have spared nothing to make it the finest little motor that can be produced. It has less real competition in its class than any other size or type of motor built.

Over three hundred of these motors are now giving wonderful service in runabouts, tenders, dinghys, hydroplanes and small cruisers. The motor uses only about two-thirds of a gallon of gasoline an hour and half a gallon of lubricating oil in twenty-four hours. Conservatively rated at 10 H. P., it develops 14 H. P. easily at high speeds.

Details of the "Small Aristocrat"

Latest Four Cycle Type—10-14 H.P.
Four Cylinders, Cast En Block Removable Cylinder Head
2 1/2" Bore 4" Stroke
High Tension Magneto
Kingston Carburetor
Bronze Gear Water Pump
Detroit Standard Reverse Gear
One Piece Cam Shaft
Lubrication by Pump and Relief
High Carbon Steel Crank Shaft and Connecting Rods
Weight Complete less than 275 lbs.



Those who are looking for high quality in a small engine will find nothing better than this one. By concentrating on one model we have been able to produce it at a remarkable price, quality considered.

\$150.00 Complete

Write to-day for further details.

Reliable Agents Wanted Everywhere.

**THE HERRMANN
ENGINEERING
COMPANY**

650 Franklin St.

DETROIT,
MICH.

HOLMES-HOWARD HIGH GRADE MARINE MOTORS

The Holmes-Howard motor illustrated is a strictly high grade light weight unit power plant of the two cycle three port type. It has two cylinders cast in a block and is rated at 6 to 8 horsepower. The motor complete, including reverse gear, magneto and all equipment weighs only 125 pounds.

Suitable for Many Types of Boats

This motor was designed especially for small runabouts and fine yacht tenders or dinghys. It is light enough to install in a canoe, fast enough for a racer, and powerful enough to drive a 25-foot boat 8 to 10 miles per hour. Combining power, speed and light weight, it is one of the most "versatile" little motors made.

You will enjoy complete boating satisfaction if you install this motor in your boat. And you will take pride in the handsome finish as well as the steady service of your engine.

Fly wheel and all brass work nickel-plated, cylinder enameled French Gray and every line and curve graceful and well proportioned. Bearings extra large. Lubrication automatic. Aluminum crank case extended to completely house the "Joe's" reverse gear. Bosch High Tension Magneto and water-proof shock-proof plugs.

\$160.00 COMPLETE, including all equipment, propeller shaft, stuffing box and propeller.

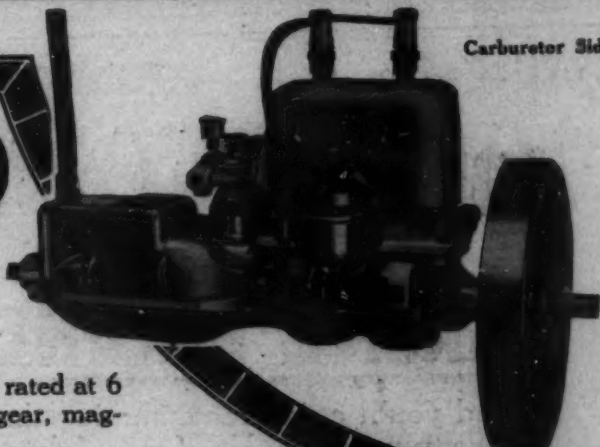
Write for prices on 4 and 6 cylinder motors.

Special Proposition for Agents.

THE HOLMES-HOWARD MOTOR CO.

Main Office: 36 Rowland Building

Detroit, Mich.



Carburetor Side



Magneto Side

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.



A Racine Cruiser Gives You Every Feature for Safety, Comfort and Convenience

HERE is a 65-foot craft that you could be proud of in any water. You will be delighted in showing your guests the conveniences in its equipment. It has everything that you could think of for safety. The layout gives you the maximum room for comfort. It's thoroughly seaworthy—has an excellent power plant—makes 12 miles per hour with ease.

Write us for a copy of our catalog 17, showing the details of construction of this and other late Racine Cruiser designs. It will pay you to get our figures.

RACINE BOAT COMPANY, 1615 Racine St., Racine, Wis., U. S. A.

You'll Enjoy a

MORRISTOWN Four Cycle MARINE ENGINE

Weight, 525 lbs., complete.
Aluminum Crank Case.
Heavy Crank Shaft.
Heavy Flywheel.
Large Bearings throughout.
Die Cast Nickel Babbit Bearings with Laminated Shims.
Manganese Bronze Connecting Rods.

One-piece Cam Shaft easily removed.
High Tension Dual Magnets.
Rotary Gear Water Pump.
Constant Level Splash Lubrication with Gear Oil Pump.
Joe's Reverse Gear on Base.
Rear Starter.
Schebler Carburetor.
Many Other Features.

Here is a motor you will enjoy every minute it is running in your boat.

And you'll enjoy remembering that you didn't pay as much for it as you would have to pay for a lot of out-of-date marine motors that are not nearly as good.

Every up-to-date idea and refinement of marine or automobile engine design is included in this Morristown Motor. The list above shows a few of the advanced features—there isn't room to show them all. The materials and workmanship are as out-of-the-ordinary as the design.

This is an ideal motor for light hydroplanes, for fast express runabouts, for cruisers. Any type of boat that requires twenty to twenty-five horsepower will secure perfect service and satisfaction from this motor.

The motor is conservatively rated at 20-25 H.P. and guaranteed to develop the full brake horsepower. It weighs 525 lbs., including reverse gear, magneto and all equipment ready to run, except the oil and gasoline.

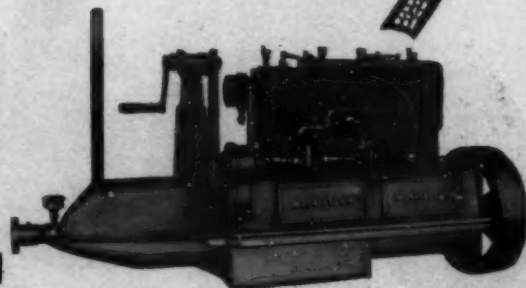
\$450.00 Net £90. 2,250 Francs

F. O. B. MORRISTOWN, N. Y.

Write for Catalog. We build 2 cycle motors also

Morristown Boat & Engine Works, Morristown, N. Y.

N. Y. Agent, Grover C. Kirchkof Co., 136 Liberty St., N. Y. City.



When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.



Caille Motors Are Sold On Performances —Not Promises

Anybody can build a marine motor and publish a lingo of claims and promises about what it will do and can do, a mile long. But all that "bunk" won't do you a particle of good when you're six miles from shore and that engine goes on a "strike."

We found that out 13 years ago. But every time a Caille motor went on a "strike" and refused to go, we nestled right down beside her and studied and worked until we found out just why she wouldn't go. Then we corrected the difficulty for keeps.

As a result, there are no more dependable motors of any style or type made anywhere on the face of the earth than Caille Motors. Now that's not "bunk." Any Caille user will tell you so. Not a day goes by but what they tell of their Caille satisfaction.

One man covered 5000 miles from Seattle, Wash., to Nome,

Alaska, with a 25 ft. boat equipped with an 8 H. P. Caille without a moment's engine trouble. Two boys, aged 14 and 16 years, installed an 8 H. P. Unit Plant in their launch named "Silver Heels." Then they went in for racing and won nine firsts out of nine races. Their picture appears below. Another man installed an 8 H. P. Caille Heavy Duty motor in a 32 ft. fishing boat. He had a load of fish when a storm was encountered. The boat was flooded. The motor was practically submerged. His life and the lives of six others depended on its steady operation. But it never missed. Today he is a genuine Caille enthusiast. These are but a few of the thousands of examples of unusual Caille motor performance—the kind of performance that you may expect from any Caille motor—the kind of performance that prompts us to let you

Write Your Own Guarantee

if you like. It is within your rights to demand this privilege of any company. If the engine manufacturer refuses your request, you know for a positive fact that he has no more faith in his make of motor than you have. Remember, the amount of service you are going to get out of your new engine depends entirely upon the firm from whom you buy and the quality of the guarantee. We are the largest and most experienced builders of two-cycle marine motors in the world.

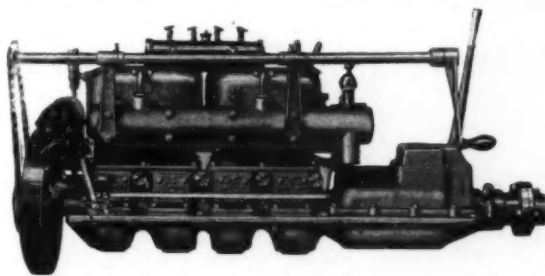
Caille's American Gentleman 18 H. P.

Here is an engine thoroughbred, a machine that arouses immediate attention wherever it is seen. The right type of motor for cruiser or gentleman's runabout, equipped with rear starter so arranged that the motor can be installed under the deck—starting handle can be fastened to bulkhead. Caille's American Gentleman is built complete in one unit with gear and engine, of course, on the same bed. The 1915 equipment also includes rear controls, multiple oiler, Bosch high tension magneto or coil and batteries as desired.

Other Types and Sizes Range From 2 H. P. to 30 H. P.

Some are extra strong and heavy for work boat service. Others are designed for large cruisers and passenger boats. And others are built with ample strength, yet reduced

weight, for smaller launches and pleasure boats. There's a Caille Motor for every service. All are fully described in our 1915 Caille Blue Book. Mail the coupon for your copy today.



Caille 18 H. P. American Gentleman Motor.

How We Help Our Customers

If you are considering a new boat, or contemplating the building of one, you are eligible for our free Boat Builder's Directory Service, the chief idea of which is to save you money. This book, compiled at considerable cost to us, gives the name and "pedigree" of the representative and reliable boat builders in every State. It gives you the same confidence in boat builders that Dun's or Bradstreet's does in commercial firms. In a great many cases, we are able to save you enough money as a result of our directory service, to pay for your boat house. If you would like to know how, say so on the coupon below and mail it to us.

Did you see our 16-page advertisement in the last issue of Motor Boating?

THE CAILLE PERFECTION MOTOR CO.

World's Largest Builders of Two-Cycle Marine Motors

1456 Caille St.,
Detroit, Mich.



1915 CAILLE BLUE BOOK COUPON

The Caille Perfection Motor Co., A.
1456 Caille St., Detroit, Mich., U. S. A.
Gentlemen:—Please send me a free copy of your latest
Marine Motor Blue Book by return mail.
I would like special information about.....

Name.....
Address.....
City.....
State.....

THE "EAGLE"

Matchless in Price and Efficiency. The Leader in Quality, Design and Variety. Lighter and Better Than Two-Cycle Engines Usually Offered. An Engine for Every Purpose. No Substitution Necessary. Made in High Speed, Medium Speed and Extra Heavy Duty Models.

REAL VALUE

Only Reliable Products Can be
Continuously Advertised

It is real value that has created such an unusual demand for "Eagle" engines. It is real value that compels us to build more "Eagle" engines each year. It is a real value that has forced "Eagle" engine sales by leaps and bounds.

It is real value and results that encourage the best distributors in every country in the world to handle "Eagle" engines.

It is real value of "Eagle" engines that has established their right to consideration.

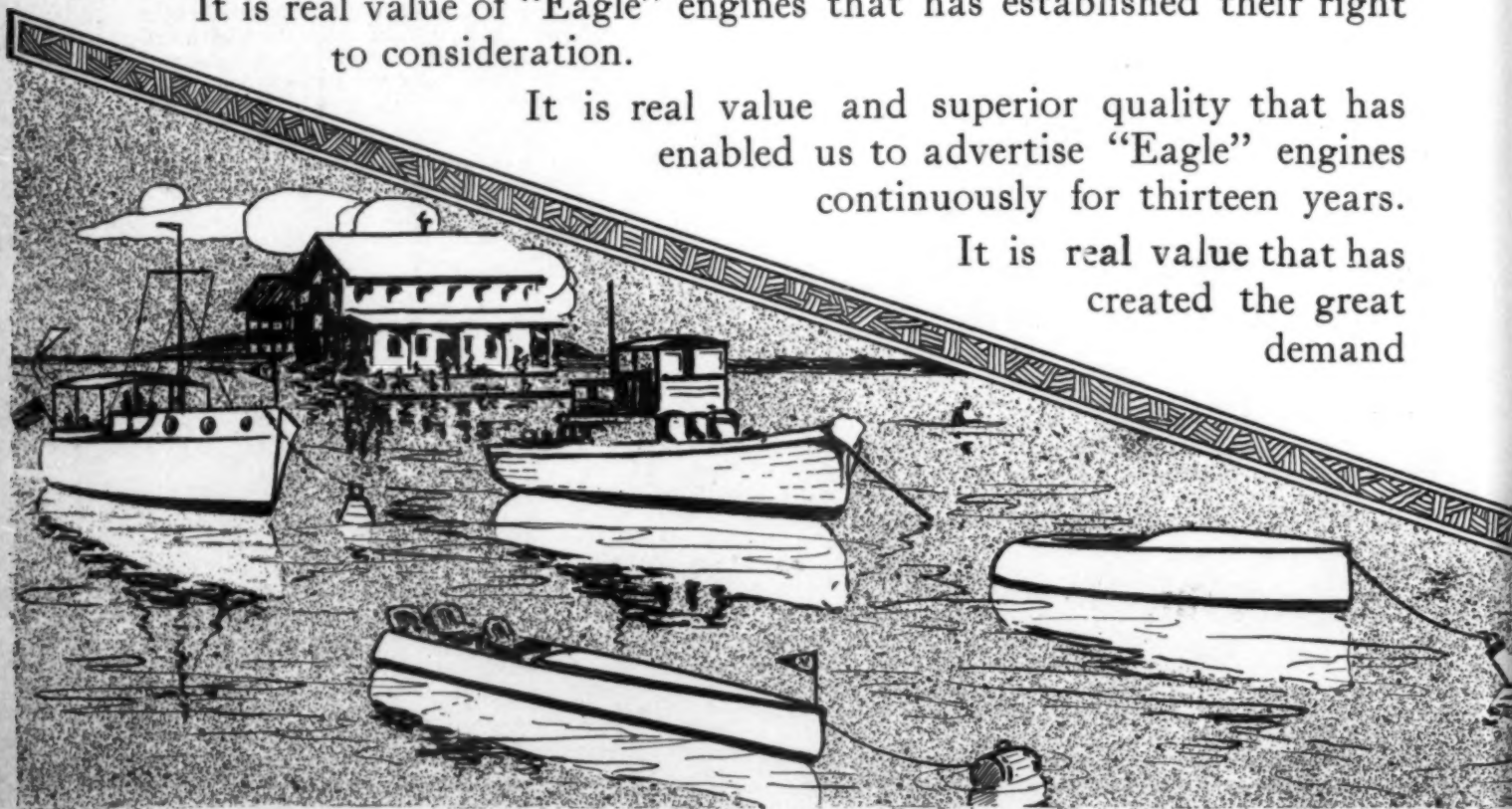
It is real value and superior quality that has enabled us to advertise "Eagle" engines continuously for thirteen years.

It is real value that has created the great demand



THE FLYING "EAGLE"

16-foot Displacement Boat. Guaranteed speed 22 miles per hour.
The fastest boat in the world for its size and horse power.
Write for particulars





for "Eagle" engines,
and this the best evidence
that they are what the trade desire.

SERVICE is the Most Essential Feature in accomplishing this result.

SERVICE, AS WE UNDERSTAND IT, is doing business on the right principle. Not considering our obligation terminated until every customer is satisfied. SERVICE, AS WE UNDERSTAND IT, requires organization, capital, brains, and a desire to retain everyone's good will.

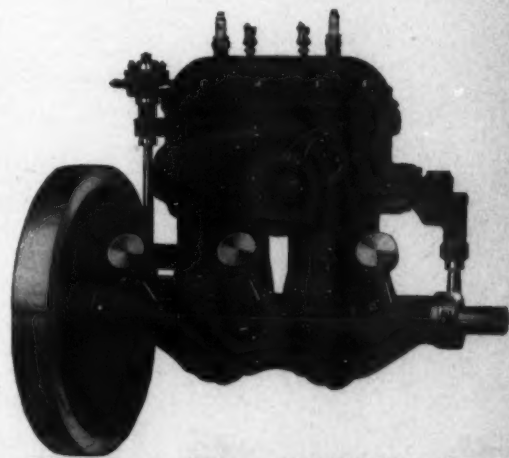
SERVICE, AS WE UNDERSTAND IT, is delivering "Engines" when you want them, parts when you want them, and for models that you have, regardless of the year when they were purchased.

In the final show-down, in the analysis of the game of business building, can you locate anything more beneficial to safe, sane and sure growth, than a satisfied customer, made so by competent workmanship and fair dealing?

A RESPONSIBLE AGENT

who knows the motor boat trade of his district can easily develop a quick growing business in Eagle Motors. If you are interested will you kindly write us your qualifications and the trade possibilities in your territory. We will then mail you our big illustrated catalogue.

We want you to know us in the same way that other successful distributors and dealers know us. We want you to become a part of our live organization. It will, we are sure, add to your income to sell "The Matchless Eagle" line of Engines, that are sold at matchless prices.



The illustration shows our Model 2 "O" 12 H. P.
High Speed, 3 port 2 cycle Engine,



The Standard Company,

Torrington, Conn.
U. S. A.

EAGLE DISTRIBUTORS

SAN FRANCISCO, CALIF.—The Standard Co., 1028 Geary St.
LOS ANGELES, CAL.—Marine Equipment Co., 729 So. Los Angeles St.
SEATTLE, WASH.—The Standard Co., 1628 Broadway.
CHICAGO, ILL.—H. R. Chadwick & Co., 1205 So. Michigan Ave.
GALVESTON, TEXAS—Barden Elec. & Mach. Co., 712 Tremont St.
NEW ORLEANS, LA.—Stauffer, Eshleman & Co., Ltd., 511 Canal St.
NEW YORK, N. Y.—Bruns, Kimball & Co., 115 Liberty St.
CLEVELAND, O.—Motor, Boat & Supply Co., 1411 W. 9th St.
CINCINNATI, O.—Motor, Boat & Auto Sup. Co., 311 Main St.
HOUSTON, TEXAS—Barden Elec. & Mach. Co., 111 Main St.
BALTIMORE, MD.—Unger & Mahon, Inc., Pratt & Gay Sta.
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The Evidence

MILES **24,000** MILES
Of Hard and Constant Service

Porcupine, Ont., November 11, 1914.

KERMATH MFG. CO.,
Detroit.

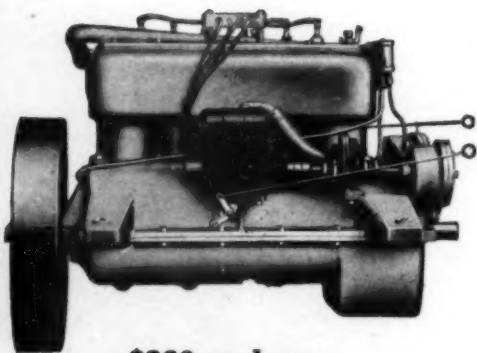
Dear Sirs: Kindly ship to us by express six piston rings for engine No. 1093, 12 H.P.

It might be of interest to you to know that this engine has during the past two seasons traveled over 24,000 miles on her regular trips. During this period her repair bill has been \$5.40, and this was due to carelessness. It is installed in a 30-foot boat with stationary top and drives it nine miles per hour. We might say that we operate a number of engines in our business, but during our twelve years' experience have never (with one exception) had as much satisfaction with gasoline engines.

Yours, truly,

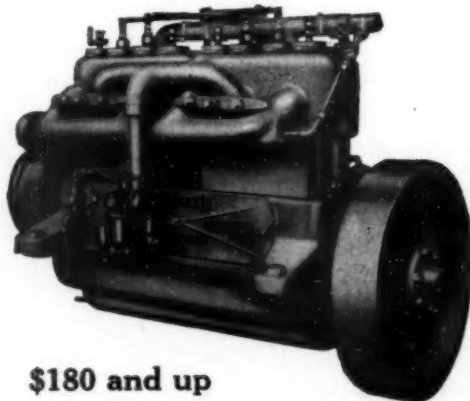
PORCUPINE FERRY COMPANY.

A. C. White, Mgr.



\$280 and up

20 H. P. 4-Cycle 4-Cylinder



\$180 and up

12 H. P. 4-Cycle 4-Cylinder

Every Kermath Engine has that same "Built In Engine Service" and will give you the same results as obtained by the Porcupine Ferry Co.

"Get Wise" and recognize "Real Value"

KERMATH MFG. CO. DEPT. 2.
DETROIT, MICH.



Type No. 206
200 A. H. Capacity

Thomas A. Edison

THOMAS A. EDISON, Inc.

261 Lakeside Avenue

Orange, N. J.

Do you get Dependability and Economy from your Ignition Batteries?

Three features stand out prominently in connection with the Edison Sparking Outfit, viz: simplicity, reliability and economy.

A casual inspection of the various ignition systems is sufficient to bring out the first point, the simple Edison Outfit with but one connection to a cell, as against the multiple battery scheme with its bank of short-lived cells or mechanical ignition with its moving parts.

On the score of reliability little need be said of the

Edison Primary Battery

The fact that it is standard on practically all closed circuit work, and is used extensively for open circuit service where dependability is essential, speaks for itself. Ignition requires an almost constant flow of current, and a cell capable of hard work such as the Edison should be used.

Many people have had the unsatisfactory experience of losing a large amount of energy on account of the cells drying out and this trouble can be avoided by the use of Edison Primary Cells. The Edison Cells are, therefore, economical, because they make the best use of material, and because the active material costs less per unit of energy than in primary cells of other types.

Catalog and Ignition folder on request

Sell Your Motor Boat or Motor in Motor Boating's Market Place

When a man is looking for a certain article he naturally refers to the place where he will be most likely to find what he wants. Thousands of readers know of the bargains that are always listed in the Motor Boating Market Place, so they look here first.

Successful advertisers follow the same course as those who are looking for something—they place their advertisements where they are most likely to be seen by prospective buyers.

Motor Boating has a guaranteed circulation in excess of 25,000 copies per issue, and every copy is seen by several persons. Practically every motor boat enthusiast in the country is reached, as well as the principal foreign markets. In this great audience there are sure to be several prospective customers for every article you want to sell.

We will write your advertisement if you will send full information and tell the amount of space you wish used. Enclose remittance to cover size of advertisement you want, figuring at the rate of 3 cents per word, each insertion.

Mail Your Advertisement To-day

J. S. Hildreth
Adv. Mgr.

**MOTOR
BOATING**

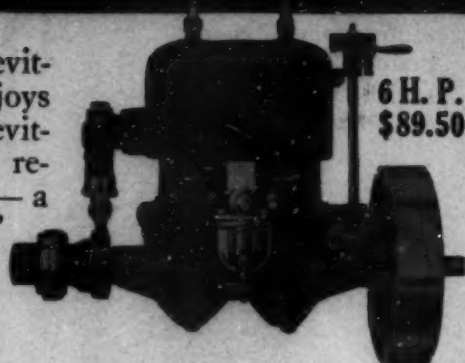
119 West 40th St.
New York

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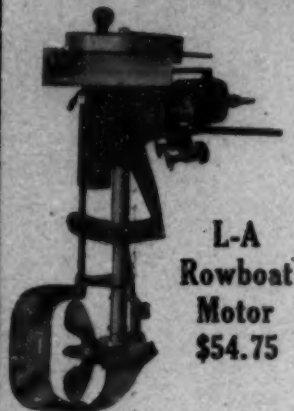
Get the *LA* Engine Book NOW and Save Money



NEVITABLY, winter will pass. Inevitably summer with the ever alluring joys of motor boating will return. Just as inevitably you will want a staunch, reliable Lockwood-Ash Motor — a motor that's always "on the job." So why not take time by the forelock, and choose your motor NOW?



Post Yourself on How You Can Buy Direct from the Factory and Save the Dealer's Profit



L-A
Rowboat
Motor
\$54.75

Learn about our 30 days' trial offer which makes it just as safe to buy an L-A Motor on our Direct-from-Factory, Freight-Paid plan, as though you were dealing with your most trusted neighbor. Six models all guaranteed for one year and sold on 30 days' trial. No strings to this offer, no freight to pay. If you're not delighted with the motor, you return it *at our expense*. The 6 H. P. Motor with Outfit complete, here illustrated, freight paid, only \$89.50 — a clear saving of at least 25 per cent. Write today for the L-A Engine book, and take time in looking over the different models. Why wait? It's worth while to investigate now.

Lockwood-Ash Motor Co.

132 Horton Avenue

Jackson, Mich.

**VIPER FIFTH TYPE
SURFACE PROPELLERS**

VIPER
REG. TRADE MARK

THE SEA SLED
HICKMAN PATENTS

The Only Satisfactory Motor-Speed Boat



24-Foot Sea Sled running at 35 miles an hour in open water.

The only boat to carry the number of people you would carry in your car, over ordinary rough water, at the same speed your car would make on land, free from pounding, free from flying water and free from danger.

WATCH THE ONCOMING OF THE SURFACE PROPELLER

New Sea Sled Bulletin ready

MURRAY & TREGURTHA CO.,
340 West First Street, South Boston, Mass.

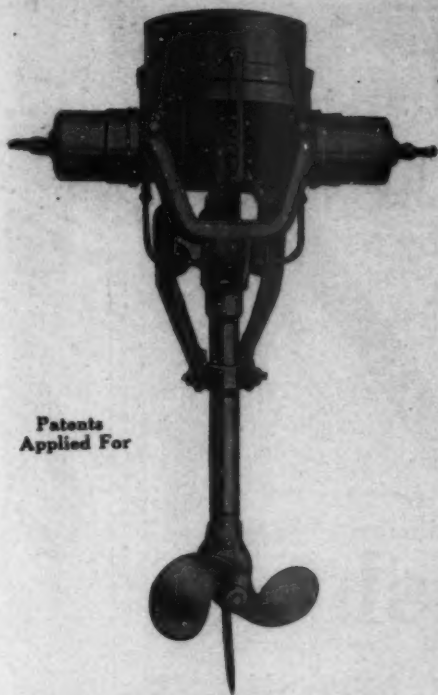
THE VIPER CO., Ltd.,
PICTOU, Canada

"COMPARISONS MAKE OWNERS"

All Enclosed Like the
Automobile Power
Plants

NO-RO

New Principle Under-
Water Exhaust



Patents
Applied For

PRESTO MOTORS
"Simplicity Motorfied"
Two Cylinders—3 Real Horse Power

What made the automobile industry drop the
single-cylinder principle?

Because among this great accumulation of BRAINS and WEALTH the MORE
BRAINY knew the principle was INCORRECT.

PROOF

The entire industry of automobile manufacturers of today are building
multi-cylinder power plants and the most successful and up-to-date have

ENCLOSED POWER PLANTS

giving protection to both machinery and operator from injury and dirt. Also
elimination of

DISASTROUS VIBRATORY EFFECTS

found in the one-cylinder principle, which cause undue wear and weakening
of the entire construction to which the motor is applied.

NO-RO MOTORS make it possible for you to profit by the experience
which cost the manufacturer, and users, millions of dollars and time paying
the experimental bills in the automobile industry for single-cylinder
BLUNDERS. Are you going to let history repeat itself in the detachable
row boat motor field?

IT'S UP TO YOU

THE WRONG PRINCIPLE IS NOT CHEAP AT ANY PRICE
CATALOG ON REQUEST

NO-RO MOTOR WORKS, Inc., Boston, Mass. U.S.A.

ECONOMY EFFICIENCY



RALACO

THE SILENT
SIMPLIFIED ENGINE

SILENCE SIMPLICITY

IF you install a Ralaco Engine in your boat, you can
expect uninterrupted power service as long as
your boat lasts, with the lowest cost for fuel and
maintenance that any engine of any type could give.
From a business standpoint, we believe the Ralaco
Engines have established by their steady, reliable
service the most valuable selling reputation of any
power plant built for the same class of work.
A Ralaco makes a quiet, clean, cool engine-room. It
is the kind of an engine the owner likes to handle

himself—the kind of an engine, too, that you can
entrust to an inexperienced assistant without fear of
trouble. For cruisers or work boats, in fact any type
of craft requiring from 10 to 75 H.P., it is impossible
to buy a more satisfactory power plant, or one that
will cost less in the long run. Ralaco economy in
a couple of seasons pays the difference in cost be-
tween a Ralaco and a cheaper engine.

Write to-day for the complete Ralaco catalog



The Six-Cylinder 7 x 9 in. Ralaco. 75 H.P.

THE S. M. JONES COMPANY

Main Office and Factory:
616 Segur Avenue, Toledo, Ohio

Representatives:
POWER BOAT ENGINEERING COMPANY,
136 Liberty Street, New York, N. Y.
A. W. LaPage Gasoline Engine & Supply Co.,
Vancouver, B. C.

Try **Kyanize** Once

KY-AN-IZE

Ask for the Waterproof VARNISH in the triangular can. It's not only Waterproof, but Weatherproof too and is not affected by Wind, Rain, Sun, Heat or Cold. Will not turn white or blue in any kind of water.

Boston Varnish Company

Everett Station Boston, U.S.A.




B. & B. Propellers

The Wheel that leads in the United States



We Guarantee

1 to 3 Miles Per Hour

To Increase the Speed of Your Boat

This is the guarantee we have been making for the past five years, the guarantee under which we have sold thousands of B. & B. propellers. This is your protection and insurance of satisfaction when you buy a B. & B. wheel. You don't have to depend on argument or unfounded claims.

B. & B. propellers give you the highest degree of speed and power your boat and engine are capable of. Their efficiency is as near perfection as it is possible to attain. They reduce the percentage of slip and produce the maximum propelling force for the horse power used.

Bryant & Berry

28 Atwater St. Detroit, Mich.

"1915" Big Drop in Prices

Same Guarantee Prevails
Prices F. O. B. Factory
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E. J. Willis Co., New York.

Two Blades		Three Blades	
Right or Left Hand—Polished		Right or Left Hand—Polished	
Diam.	Price	Diam.	Price
8 in.	\$1.35	8 in.	\$1.65
9 "	1.65	9 "	1.95
10 "	1.80	10 "	2.10
11 "	2.10	11 "	2.85
12 "	2.25	12 "	3.30
13 "	2.70	13 "	3.90
14 "	2.88	14 "	4.20
15 "	3.15	15 "	5.10
16 "	3.90	16 "	5.70
17 "	4.50	17 "	6.30
18 "	4.95	18 "	6.90
19 "	6.00	19 "	8.10
20 "	6.60	20 "	9.00
21 "	7.50	21 "	9.90
22 "	8.10	22 "	10.80
23 "	9.00	23 "	12.90
24 "	9.60	24 "	13.80
26 "	12.00	26 "	16.80
28 "	15.00	28 "	20.40

Wilco Boat Supplies

The Fittings that are Right
A guarantee with every article.

\$49.95



"WILCO" PORTABLE MOTORS

Complete with Batteries and Coil—
Ready to run \$49.95

GUARANTEED

2 H. P. at 900 R. P. M.
Bronze Propeller
Bronze Gear Housing
Bronze Water Pump

Bronze Crank Case
Bronze Connecting Rod
BEST in every particular

Outfit fitted with High Tension Reversible, Waterproof Magneto.
Price, \$59.95.

Special Circular Mailed Free
Complete Catalog "B" Motor Boat
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E. J. Willis Co.

85 Chambers St., New York

Red Wing Thorobred

THE MOTOR WITH POWER TO SPARE

Install: That's All:

That's crisp and short. But it tells the story of the "Thorobred." When the Boat Builder installs a "Thorobred," he's through. No comebacks. No kicks. No adjusting. No changing.

A whirl of the wheel and she's off, for steady, unfailing service for years to come, no matter whether it is in a hydroplane, a family cruiser, a fast runabout or a money-earning work boat. And besides—pleased owners will recommend this boat builder to their friends, which means new orders and more business.

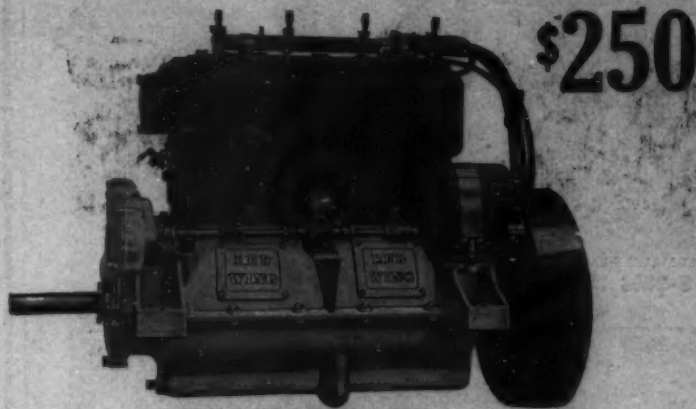
We have a special proposition for Boat Builders and Agents. Write.

Model C, 4 1/16 x 4 1/2" . . . 24-32 H.P., \$250

Model F, 4 1/16 x 5" . . . 28-36 H.P., \$275

Model B, 4 1/2 x 5" . . . 32-40 H.P., \$350

RED WING MOTOR COMPANY, Dept. B, Red Wing, Minn., U.S.A.



RED WING THOROBRED



THE 1915 MODEL MILLER

is a true unit power plant of wonderful efficiency. Cylinders are cast en bloc with special provision to make easy removal of pistons possible. Fly-wheel is placed close to the reverse gear where it gives more direct power, and all moving parts are enclosed. Miller Motors are of the four-cycle type, built with one, two and four cylinders, from 4 to 60 H.P., designed to meet every requirement. There isn't a cleaner, more attractive and more up-to-date Engine made. It is furnished with the complete marine equipment, no extras being necessary, and price is right.



Miller Portable Motor

With Reversible Propeller

This is without question the highest development of Portable Motors, the Motor that has broken all previous records. The reversible propeller is operated by the steering lever through patented mechanical devices. A forward, reverse and neutral position is provided for, and changes from one to the other are instantly made. No slacking down of speed to reverse, no cranking of motor in opposite direction. A mere touch of the lever gives absolute control of motor and boat. The Miller is the perfect Outboard Motor of the future. It is strictly high grade, furnished with Battery ignition, or Bosch Waterproof Magneto with advance.

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SANDS

SANITARY FIXTURES

Four Special Closets



PLATE S-128.
The "Gleason" Composition San Closet, for use on ships and discharges of closets.



"COMMERCIAL," PLATE S-2070. "FRISCO" PUMP CLOSET FOR "WORK BOATS." VITRO-ADAMANT OVAL BOWL COMPOSITION 3" PUMP, FINISHED SMOOTH, OAK SEAT AND COVER, \$95.00. OAK SEAT, NO COVER. **\$59.00**

Plate S-2070 "COMMERCIAL" CLOSET FOR "WORK BOATS." VITRO-ADAMANT OVAL BOWL, COMPOSITION FLUSH VALVE, OAK SEAT AND COVER, \$95.00. OAK SEAT, NO COVER. **\$47.50**



PLATE S-2062.
The "Anglo" Composition "Sealed" San Valve, for use on small pump closets.



"KNOCKABOUT," PLATE S-34. "KNOCKABOUT" IMPROVED PUMP WATER CLOSET. VITRO-ADAMANT ROUND HOPPER BOWL, 2 1/4" ROUGH PUMP, OAK SEAT AND COVER. **\$49.00**

Plate S-2060 "WINNER" PUMP WATER CLOSET. VITRO-ADAMANT ROUND HOPPER BOWL, 2 1/4" ROUGH PUMP, OAK SEAT AND COVER, \$35.00. OAK SEAT, NO COVER. **\$19.00**



PLATE S-4280.
New Pattern Improved All Brass Galley Pump, 2" cylinder with shut off cock. Pat. Brass. \$12.50 Pat. & N.P. 14.00

We make special pumps for oil and gasoline fitted with brass valves.

PLATE S-102.
The "Gleason" Folding Lavatory, with Vitro-Adamant roll rim tipped oval basin, N. P. copper lining, soap and brush holder. N. P. brass double-acting pump with combination swing supply faucet. N. P. brass towel rack. N. P. brass supply and waste couplings. N. P. brass trimmings. Quartered oak, polished mahogany, polished hatch, and **\$42.50** add **1.50**

PLATE S-767.
All Brass, Basin, Galley or Bilge Pump, with 3" cylinder, mounted on hardwood plank, rounded handle, N. P. ferro-cast and 1/2" can be used either right or left hand. Pump rough with galvanized trimmings \$9.00 Pump and gearings polished \$11.00 Pump and gearings nickel-plated \$12.50

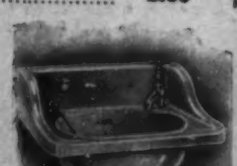


PLATE S-1002.
Recess Flange Composition Monitor Air Parts, with heavy brass frame and hinge to give sufficient rigidity to prevent springing and breaking the glass. Diam. of Opening Plain 8 in. \$16.75 10 in. \$17.00 12 in. \$17.50 14 in. \$18.00 16 in. \$18.50 18 in. \$19.00 20 in. \$19.50 Larger sizes also made. Prices on request.

PLATE S-3100.
The "Monitor" 14" Vitro-Adamant lavatory, one N. P. compression faucet, waste piping and brass trap, chain, stay and rubber stopper. \$15.25

PLATE S-128.
The "Holena" Composition Outboard Connection with stop valve and coupling used on discharges of closets, lavatories, sinks or on exhaust of engine. 1/2" L. P. \$9.00 3/4" L. P. \$9.75 1" L. P. \$10.50 1 1/4" L. P. \$11.50 1 1/2" L. P. \$12.50 2" L. P. \$14.00 2 1/2" L. P. \$15.00 3" L. P. \$16.00 3 1/2" L. P. \$17.00 4" L. P. \$18.00 4 1/2" L. P. \$19.00 5" L. P. \$20.00 5 1/2" L. P. \$21.00 6" L. P. \$22.00 6 1/2" L. P. \$23.00 7" L. P. \$24.00 7 1/2" L. P. \$25.00 8" L. P. \$26.00 8 1/2" L. P. \$27.00 9" L. P. \$28.00 9 1/2" L. P. \$29.00 10" L. P. \$30.00 10 1/2" L. P. \$31.00 11" L. P. \$32.00 11 1/2" L. P. \$33.00 12" L. P. \$34.00 12 1/2" L. P. \$35.00 13" L. P. \$36.00 13 1/2" L. P. \$37.00 14" L. P. \$38.00 14 1/2" L. P. \$39.00 15" L. P. \$40.00 15 1/2" L. P. \$41.00 16" L. P. \$42.00 16 1/2" L. P. \$43.00 17" L. P. \$44.00 17 1/2" L. P. \$45.00 18" L. P. \$46.00 18 1/2" L. P. \$47.00 19" L. P. \$48.00 19 1/2" L. P. \$49.00 20" L. P. \$50.00 20 1/2" L. P. \$51.00 21" L. 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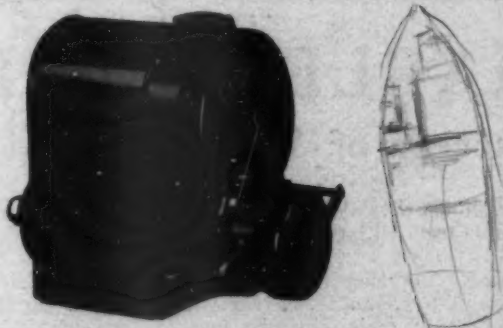
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Up to the present time it has been impossible to establish manufacturing conditions in the United States that would warrant us in departing from the automobile and truck fields.

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It indicates exactly the revolutions per minute your engine is making. From its readings you are able to instantly detect the slightest irregularity. On twin-screw craft this device is indispensable for maintaining both screws at the uniform speed which insures easy steering.

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Bear this in mind—good plugs are more than half of good ignition. You are always sure of the highest efficiency in your plug's operation when you use the

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The two-unit construction facilitates disassembling, and because the joints are absolutely gas-tight, you do not have compression leakage. Insulator is made from highly tempered clays and successfully resists sudden changes in temperature. We guarantee every J-M (Mexger) Soot-Proof Spark Plug to give the best service of any high-grade plug.

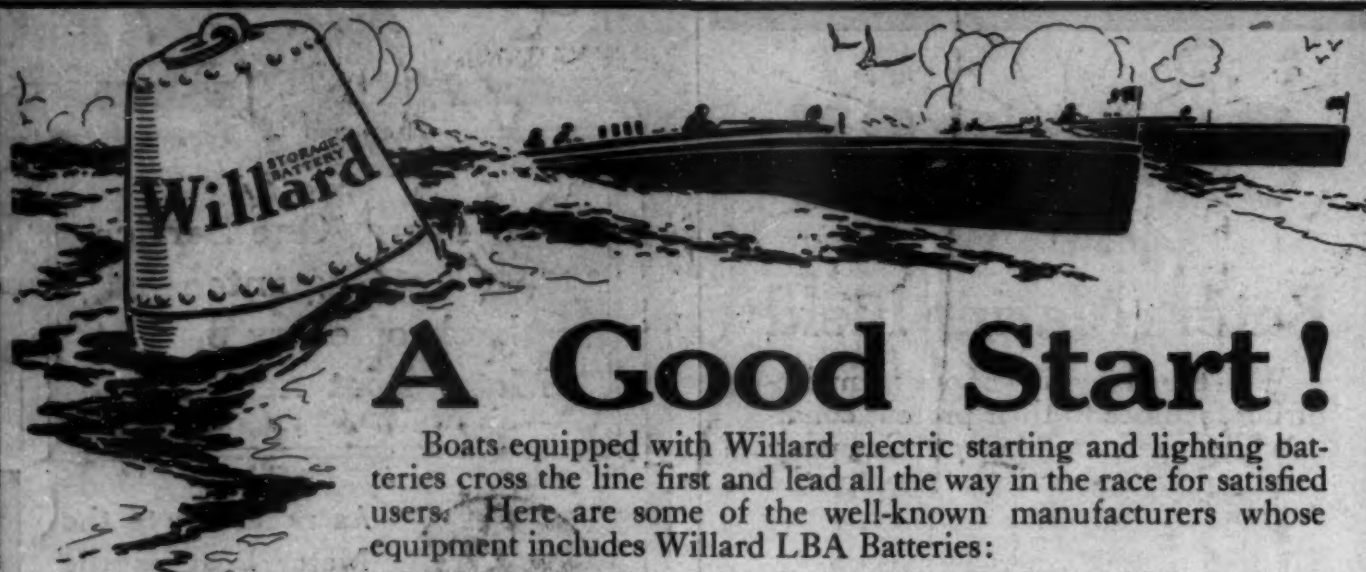
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Boats equipped with Willard electric starting and lighting batteries cross the line first and lead all the way in the race for satisfied users. Here are some of the well-known manufacturers whose equipment includes Willard LBA Batteries:

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 Fay & Bowen Engine Co.....Geneva, N. Y.
 Ferro Machine & Foundry Co.....Cleveland, O.
 Fulton Manufacturing Co.....Erie, Pa.
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 Ginman Boat Co.....Muskegon, Mich.

S. M. Jones Co.....Toledo, Ohio
 Geo. Lawley & Son, Corp.....Neponset, Mass.
 Loew Victor Engine Co.....Chicago, Ill.
 Matthews Boat Co.....Pt. Clinton, Ohio
 Milwaukee Yacht & Boat Co., Milwaukee, Wis.
 W. H. Mullins Co.....Salem, Ohio
 Niagara Motors & Mfg. Co., Inc., Dunkirk, N. Y.
 Peckham Marine Motor Co.....Buffalo, N. Y.
 Regal Gasoline Engine Co., Coldwater, Mich.
 Red Wing Motor Co.....Red Wing, Minn.

Roberts Motor Co.....Sandusky, Ohio
 Sterling Engine Co.....Buffalo, N. Y.
 Chas. L. Seabury & Co., Morris Heights, N. Y.
 Scripps Motor Co.....Detroit, Mich.
 Valley Boat & Engine Co.....Saginaw, Mich.
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 Warren Boat Co.....Chicago, Ill.
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The 24 H.P. size is one of the most popular of the LAMB sizes. Very compact, easy of operation, dependable, economical, pleasing in appearance and extremely smooth running, it is bound to commend itself to your attention. Built in a plant as completely equipped as is the LAMB factory, by mechanics skilled in their particular part of the work, it is bound to give that complete reliability and satisfaction so much desired in the cruising type of boat.

LAMB engines are built in a variety of sizes and are adapted to every purpose. Guaranteed as long as they are owned they fulfill our every claim.

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'Co-operation a
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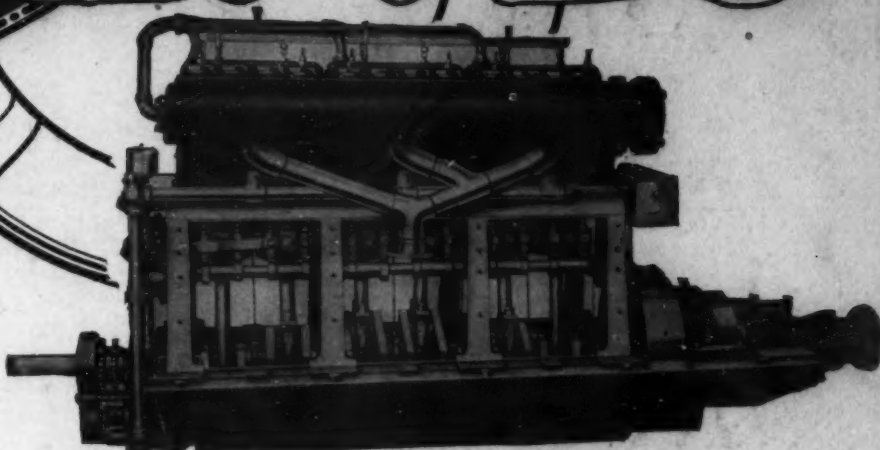
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The Lamb Engine Company, 807, 30 Church Street, New York, Distributors to Eastern Canadian and Atlantic Coast Agents

HOLMES



Side plates off, showing working parts exposed

IT'S a big sturdy quiet engine that is absolutely in a class by itself for reliability. Men risk their lives on these engines, going out under conditions where the slightest hesitation on the part of the engine would mean certain destruction for the boat and its occupants. Such men spare nothing to find the right motor. They buy the Holmes, the motor the life savers use.

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If you are looking for the **best** motor, compare the Holmes with any you have seen. Let us help you in analyzing them all.

Do You Want a Boat, as Reliable as the Holmes Motor?

The Holmes McLellan Lifeboat Cruiser is a refinement of the open cockpit type life boat, of which over a hundred are in use by the Life Saving Services of the United States and Canada. It is Non-Sinkable, Self-righting and Self-bailing. Water-tight bulkheads and air cases provide sufficient buoyancy to float the boat if stove.

The cabin accommodations are unusually large, complete and comfortable. The speed is over $9\frac{1}{2}$ miles an hour with a 20-25 H.P. Holmes Motor, which is mounted in an entirely separate fireproof compartment. About 11 miles with the 35 H.P. Life Boat Special Motor.

The plans and finish of this boat can be varied to suit different requirement without sacrificing any of its exclusive features of safety.

In localities where we have no agent, the first purchaser of a Holmes motor will be given the agents' discount.

H. C. BAXTER & BRO.
PACKERS OF CANNED GOODS

Brunswick, Maine, Nov. 18, 1914.

The Holmes Motor Co., Inc.,

50 State St., BOSTON, MASS.

Gentlemen: Since you installed the two 75 h.p. Holmes engines in my power yacht KANAWHA last winter, I have had no trouble whatever with them, and they have worked smoothly and quietly from the start, and have given excellent satisfaction. The engines which you took out of the boat caused me much trouble. A considerable part of the time I had to run on one engine—and their hammering caused me to be about "sick" of the boat. This is all over now, and I can go out with comfort.

The KANAWHA is 75 ft. long, 13 ft. beam, 4½ ft. draught.

Yours truly,

H. C. BAXTER.

HCB/B



Write us to-day for full details of either the boat or motor, or ask about both.

The Holmes Motor Company, Inc.

50 State Street Boston, Mass.
Works at West Mystic, Conn.

A New 25 H.P.

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THE ENGINE of REFINEMENT
For the finest boats that float

\$515!

IT IS the first time an engine of this size and quality has been sold at such a price. A true Sterling, through and through—in every detail of design, construction, finish and equipment. It establishes a standard of value that has never been equalled in a high grade power plant suitable for boats from 20 to 30 feet in length.

If you know the Sterling reputation and standing among boatmen and dealers—the Sterling reliability, efficiency and superiority—it will be unnecessary for us to elaborate on the quality of this new model. Suffice it to say that it is backed by the Sterling Guarantee and the Sterling Reputation that we value more highly than the profit on a thousand engines.

This Is the Engine for Your Next Boat

Four Cylinders—Weight 525 lbs.

3 1/4" Bore, 5 1/2" Stroke

Speed 200 to 1200 R.P.M.

25 H.P. at 1,000 R.P.M.

Exceptionally long stroke, giving more power, less vibration, higher efficiency.

Powerful, Reliable, Efficient.

Simple, Clean, Compact, Noiseless, Vibrationless, Moving Parts Enclosed.

Magneto placed high up to avoid water, dirt, etc.

Automatic self-contained oiling system with level gauge

Completely Equipped

High Tension Magneto

Special Sterling Rear Starter

Reverse Gear and Clutch

Flange Shaft Coupling

Carburetor; Water Pump; Spark Plugs;

Switch; Gasoline Strainer

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Steel Shaft

Bronze Propeller Wheel

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Extra Parts

Gallon of Lubricating Oil

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You'll find this engine a little more satisfactory than any engine you have ever owned. It costs so little more than the ordinary engines of its own size that it is a better investment, service considered, than any other.

Let us send you a copy of the 52 page Sterling Catalog, 1915 Edition. It gives full details of our eighteen different models, for racing, medium duty and heavy duty.

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